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Ding Wang on CPC Third Echelon

40050194 Hong Kong CHAO LIU [TIDE] in Chinese
No 13, 15 Mar 88 pp 23-26

[Article by Ding Wang [0002 2598], deputy chief editor of GAIGE [REFORM], journal of the Chongqing Academy of Social Sciences: "The CPC's Third Echelon of Successors and Their Special Role"]

[Text] The CPC's plan for raising a third echelon of successors has by now reached its final stage.

During September and October 1987, Communist China convened its 13th CPC National Congress and the 1st Plenum of the 13th Central Committee, and reorganized the central organs of the CPC. This was followed by gradual personnel adjustments in the local party and government leadership organs. On 25 March of this year, Communist China convened the First Session of the Seventh NPC, which subjected the organs or state power, the State Council and the Standing Committee of the NPC, to comprehensive reorganizations. With these reorganizations, the transfer of state power in Communist China's highest levels was temporarily brought to a close.

By now, almost all of the first generation of old men past 75 have been eliminated from the "central-rank" decision-making and executive organs, comprising the Politburo, Secretariat, and State Council, as powers were transferred to the second and third echelon, with the third echelon assuming a role of increasing potential. In the local organs, real power had already much earlier shifted to the third echelon.

Since holding its 13th National Congress in September of 1983, the CPC has been carrying out a comprehensive plan for replacements on a massive scale by third echelon personnel, and powers were transferred, centrally as well as locally, in a "ladderlike" manner. At the start, it was at the basic-levels up to provincial levels that Communist China's political powers were gradually transferred to the third echelon. Later pressure rose upward, resulting in similar transfers of power in the "central" strata. These "ladderlike transfers" also generated a "generationwise hand-over" of executive powers. At the start, there was the hand-over from the first echelon to the second echelon in the decision-making and executive organs of the CPC's central agencies, followed, after the 13th Central Committee, by a hand-over from the second to the third echelon. The "proportions" obtained by the third echelon grew markedly more substantial, so that, judging by the present political situation, the "era of the third echelon" seems to have already arrived.

The present article intends to briefly discuss the definition of the third echelon, its rise in the "ladderlike transfers," and its political views and characteristics.

1. Meaning and Rise to Power of the Third Echelon

As this writer has already written at some length several years ago on the differentiation and characteristics of the various echelon in Communist China, the present article will refer only briefly to the differentiation between the three echelons.

The first echelon refers in general to those who had become communist cadres before 1937. The second echelon are those who became communist cadres between the start of the War of Resistance Against Japan (1937) and 1949.

As to the term "third echelon," this has three meanings: 1) University students who graduated after 1949; 2) Those who became communist cadres after 1949; 3) Those born during or after 1928. Persons born a year or two earlier, but officially joining as communist cadres after 1949, might as well also be included among the third echelon.

Actually, the term "third echelon" is a designation of broad meaning. If we designate as fourth echelon those born after 1949, who had become communist cadres after October 1976, i.e., after the end of the "cultural revolution," then the third echelon are only the 1950 to 1976 cadres. They would now generally be aged between 40 and 60. The fourth echelon would be below 40 years of age, as e.g., Liu Shaoqi's son Liu Yuan [0491 3293], who was recently promoted to vice governor of Henan Province.

Third echelon as used in this article is to be taken in its broad meaning.

Since September 1983, cadres of the third echelon have been promoted on a large scale. In the "ladderlike transfers" of power, members of the third echelon have, already, assumed power in prefectures, counties, and at the basic levels. By 1985, they were firmly entrenched in the party and government organs at the provincial level and in the various ministries of the State Council. At present, members of the CPC Politburo, secretaries of the CPC Secretariat, vice premiers of the State Council are posts mostly filled by members of the third echelon. Such posts as ministries under the State Council, provincial party secretariats, and provincial governorships are to a very large degree held by members of the third echelon (see Appendix 2). Only the CPC Central Military Commission is under the control of members of the first echelon. The Standing Committee of the NPC is also in the hands of members of the first and second echelon.

2. Political Views of the Third Echelon Economic Reform Faction

Members of the third echelon between the ages of 45 and 60, who hold positions in the central and local CPC organs of authority, wield very substantial power, and most of them are of the economic reform faction.

The main body of the economic reform faction is constituted by cadres of the second and third echelon. Representatives of the former are Zhao Ziyang, Wan Li [5502 6849], Hu Yaobang [5170 5069 6721], and Qiao Shi [0829 4258]; representatives of the latter are Hu Qili [5170 0796 4539], Tian Jiyun [3944 4764 0061], Li Tieying [2521 6993 2503], and Li Ruihuan [2621 3843 3883]. Li Peng [2621 7720] too, a man of the third echelon (member of the Standing Committee of the CPC Politburo and concurrently deputy president), may be considered member of the economic reform faction, but similar to Zhou Enlai, he is smooth and evasive, and sometimes takes a wait-and-see stand between the two parties.

There are also political hardliners among the third echelon. Wang Renzhi [3769 1804 0037], head of the CPC Propaganda Department, has been deeply influenced by Hu Qiaomu [5170 0829 2606] and Deng Liqun [6772 0500 5028], who have been heads in the former CPC Central Leading Group for Ideology and Propaganda.

The main political views of the economic reform party are that, faced with the realities of today, the rigid dogmas of Marxism have to be subjected to large-scale adaptations, that theories on the development of productive forces have to explored, and that conventional restrictions that obstruct the development of productive forces must be removed.

They believe that socialism and communism are things far away in the remote future, and that China is now at the poor and backward "initial stage of socialism" and must exert great efforts to develop commodity production and enhance its productive forces. While still maintaining the outward cage of a "planned economy," it is necessary to afford utmost opportunity to market functions and the law of value, and allow these factors to play a much larger role.

While still maintaining "socialism" as a remote objective, they feel it necessary to adapt "strategy," in particular to separate ownership of property and land from the right of their use, to allow "government-run" enterprises, shops, and land to be rented out to "collectives" and individuals under a contract-management system, and to open up, within certain limits, to the private economy permitting individuals to hire workers and to undertake production and business management.

They propose to broaden economic opening-up toward the outside world, to import foreign capital and foreign advanced technologies and equipment, in order to make up for the difficulties caused by insufficient capital and slow technological renovations.

They also propose to increase investments in education and in science and technology, as a way to enhance the general quality of the population so as to improve productive forces and promote social modernizations.

In political respects, in addition to consolidating the functions of the party organization, they favor the gradual establishment of the legal system. While they profess to "uphold the four cardinal principles," they consider this not to preclude relaxing controls over the intellectuals, especially providing them with a "relaxed" environment for academic discussion, and not to liquidate them politically in one form or the other.

In international affairs, they favor employing a multifaceted strategy: while promoting relations with the Western countries, efforts should simultaneously be exerted to improve relations with the Soviet Union and Eastern Europe, and, furthermore, to open up foreign trade markets in these areas (mainly to market products of the light and textile industries).

3. "Special Role" of the Third Echelon

On the political stage of Communist China, the third echelon is mostly playing a very special role, which is more powerful than that of the first and second echelon.

In promoting third-echelon successors on a massive scale, Communist China was guided by the criterion of having its future cadres "more revolutionary, of lower average age, better educated, and professionally more competent." The above-mentioned characteristic of being "more revolutionary" refers to their identifying fully with the views of Deng Xiaoping and of the party in power, and to be firm adherents of upholding "the four cardinal principles."

Those members of the third echelon who have been promoted in recent years to high-ranking cadre positions have all been up to the standards of lower average age, better education, and better professional competence. Youthful age, especially being below 55, has generally been one of the preconditions for promotion. Thus, the average age of members of the 13th Central Committee created in October 1987 (285 persons) dropped to 55.2 years, while 46.3 percent of them were below 55 years of age. Most of the provincial party secretaries and ministers of the State Council were also persons under 60 years of age.

Local personnel in responsible positions, such as assistant party secretaries or vice governors and higher ranking cadres, also cadres of "central-rank" serving as vice ministers or in higher posts, are to more than half graduates of institutions of higher learning. The proportion of those who are qualified engineers or have similar professional qualifications is also on the increase. Among the members of the Central Committee that came into being at the 13th CPC National Congress, 73.3 percent were graduates from institutions of higher learning, an increase of 18 percent compared with the previous Central Committee, and 20 percent had high-ranking technical titles, which was 6 percent more than in the previous Central Committee (see Appendix 2). In the past, very few specialists could hold posts in party or state leadership positions.

The "special characteristic of their role," requiring them to be "better educated and professionally more competent," brought forth a stratum of technocrats in mainland society. This stratum is gradually displacing Communist China's professional political workers and the military stratum. It changes the previous situation of "military men participating in politics," and reduces to its lowest point the influence of "cultural revolution" times when military men ran politics.

The rise of a stratum of technocrats on the other hand also raised the "catalytic power" that would promote social institutionalization and strengthen access to information.

Though they appeared rather late on the political stage of Communist China, cadres of the third echelon were promoted at great speed, skipping intermediary ranks. They were, therefore, lacking in solid political foundation, which gave rise to yet another of their "special characteristics": an abundance of new initiatives. Within the spheres of their powers of office, they were all eager to speedily open up a new overall situation, accomplish outstanding political achievements, and thereby create the image of a new trail-blazing power, all, furthermore, also striving to hasten their advancement.

An abundance of new impulses of course shows up as greater vitality on the political stage and will benefit progress in economic reform. But an excess of new impulses has also frequently been the cause of an inclination to be ostentatious and to exaggerate, it also frequently leads to irresponsible investments. To benefit the interests of their particular posts (localities), some would even without scruple violate provisions of "macroeconomic control" of the Central Committee. The case of Lei Yu [7191 1342] on Hainan Island, Guangdong Province, is an example that caused quite a sensation.

4. Facing Many New Knotty Problems

The rise of the third echelon in Communist China is a major development of displacing the old with the new in Chinese Communist cadre affairs. Though leading cadres at all levels of the CPC are now younger than before, they are still rather aged. The third echelon member in the CPC Politburo is close to 59, and the one in the Secretariat is 56 years of age. Among the 44 leading cadres of ministerial rank in the State Council, 29 are members of the third echelon, and their average age is close to 57. Most of the provincial party secretaries and provincial governors are close to 60. This age structure indicates that Communist China must speed up "abdications" among members of the first and second echelon and increase promotions of cadres of the 45-year age group. Otherwise, by 1992, when a new CPC Central Committee term will start, all cadres will again be too old.

Since the third echelon is the main force pushing economic reforms, their development on the political stage of Communist China will ensure stability in the general orientation of economic reforms. But many new knotty problems have appeared in the course of economic reform. Irresponsible investments have placed excessive strains on capital funds, foreign exchange, and material resources. Commodity prices have risen too steeply, individuals have failed to gain fair developmental opportunities in the economy (this relates to the "network of personal connections"), the gap between poor and rich is gradually widening, and many fail to benefit from economic reform because they lack business skills or because of the "networks of personal connections." Income of intellectuals is particularly low, and confusion is caused by the simultaneous operation of two systems of economic organization. All these things aggravate the feeling of dissatisfaction among the general public and are testing the ability of the third echelon.

Appendix 1: "Central-Rank" Representatives of Communist China's Third Echelon

Note:
Those marked (1) are members of the CPC Politburo
Those marked (2) are Politburo alternate members
Those marked (3) are secretaries of the CPC Secretariat
Those marked (4) are alternate secretaries of the CPC Secretariat
Those marked (5) are members of the CPC Central Committee
Those marked (6) are alternate members of the CPC Central Committee

Name	Age	Native of	Education at/in	Specialization	Position
1. Li Peng [2621 2590]	60	Chengdu, Sichuan	USSR; Engineering	Electrical Engineer	Standing Member CPC Politburo, Deputy President
2. Hu Qili(3) [5170 0796 4539]	59	Yulin, Shaanxi	University; Engineering	Political Cadre	Standing Member CPC Politburo
3.Tian Jiyun(1) [3944 4764 0061]	59	Feicheng, Shandong	Middle School	Political Cadre	Vice President

Name	Age	Native of	Education at/in	Specialization	Position
4. Li Tieying(1) [2521 6993 2503]	52	Changsha, Hunan	Czech.; Engineering	Electronics Engineering	Minister, Economic Reform Commission; Minister of Electronics Industry
5. Li Ruihuan(1) [2621 3843 3883]	54	Baodi, Tianjin	Sparetime University; Engineer	Architectual Technician	Tianjin Municipal Party Secretary
6. Jiang Zemin(1) [3068 3419 3046]	62	Yangzhou, Jiangsu	University; Engineering	Dynamics Engineer	Shanghai Municipal Party Secretary
7. Li Ximing(1) [2621 6932 6900]	62	Shulu, Hebei	University; Engineering	Civil Engineer	Beijing Municipal Party Secretary
8. Yang Rudai(1) [2799 3067 1486]	62	Renshou, Sichuan	Middle School	Political Cadre	Sichuan Province Party Secretary
9. Ding Guangen(2) [0002 7070 2704]	59	Wuxi, Jiangsu	University; Engineering	Transport Engineer	Minister of Railways
10. Rui Xingwen(3) [5360 2622 2429]	62	Lianshui, Jiangsu	University; Central Ideology	Chemistry Specialist	Assistant Head, Propaganda Leading Group
11. Yan Mingfu(3) [7051 2494 1788]	57	Haicheng, Liaoning	Training College; Russian	Russian Translator	Director, CPC College, United Front Russian Department
12. Wen Jiabao(4) [3306 1367 1405]	46	Tianjin	University; Engineering	Geologist	Director, CPC General Office
13. Wang Renzhi(5) [3769 1804 0037]	54	Wuxi, Jiangsu	University; Liberal Arts	Political Cadre	Director, CPC Propaganda Department
14. Zhu Liang(5) [2612 5328]	62		University; Liberal Arts	Political Cadre	Director, CPC International Liaison Department
15. Song Jian(5) [1345 0256]	56	Rongcheng, Shandong	USSR; Engineering	Automation Specialist	Councilor, State Council, Minister S&T Commission
16. Chen Junsheng(5) [7115 0193 3932]	61	Huanan, Heilongjiang		Political Cadre	Secretary General, State Council
17. Bao Tong(5) [7637 1749]	55?		University; Liberal Arts	Political Cadre	Secretary, Politiburo, Standing Committee & Vice Minister Economic Reform Commission
18. Wei Jianxing(5) [1414 0256 5887]	57	Xinchang, Zhejiang	USSR; Engineering	Mechanical Engineer	Minister of Supervision & former Director, CPC Organization Department
19. Ding Henggao(5) [0002 5899 7559]	57	Nanjing, Jiangsu	USSR; Engineering	Armament Industry Specialist	Chairman, Defense Industry Commission
20. Wu Shaozu(5) [0124 4801 4809]	55?	Leiyang, Hunan	USSR	Political Cadre	Political Commissar, Commission for Defense Industry
21. Zou Jiahua(5) [6760 1367 5478]	61	Yujiang, Jiangxi	USSR; Engineering	Machine Tool Engineer	Chairman, Machine Industry Commission
22. Jia Chunwang(5) [6328 2504 2489]	50	Beijing	University	Political Cadre	Minister for State Security
23. Ruan Chungwu(5) [7086 2504 2976]	54	Huaian, Hebei	USSR; Engineering	Mechanical Engineer	Vice Minister, S&T Commission
24. Wang Tao(5) [3769 3447]	56	Leting, Hebei	University; Engineering	Petroleum Geologist	Minister for Petroleum Industry

Name	Age	Native of	Education at/in	Specialization	Position
25. Zhu Xun(5) [2612 6064]	57	Funing, Jiangsu	University; Engineering	Geologist	Minister for Geology and Mineral Resources
26. Qi Yuanjing(5) [2058 0337 7231]	59	Wuhan, Hubei	University; Engineering	Metallurgical Engineer	Minister for Metallurgical Industry
27. Qian Qichen(5) [6929 0366 3819]	55?		University	Foreign Affairs Cadre	Vice Minister for Foreign Affairs
28. Hao Jianxiu(5) [6787 1696 4423]	52	Qingdao, Shandong	University; Engineering	Textile Engineer	Vice Minister, Planning Commission; former (3)
29. Cui Naifu(5) [1508 0035 1133]	57	Beijing	University	Political Cadre	Minister for Civil Affairs
30. Ai Maiti(5) [5337 6314 2251]	51	Cele, Xinjiang		Political Cadre	Minister, Nationalities Affairs Commission
31. Lu Peijian(5) [0712 1014 0313]	60	Hongze, Jiangsu		Political Cadre	Auditor General
32. Jiang Xinxiong(5) [5592 1800 2651]	57	Wuxing, Zhejiang	University; Engineering	Nuclear Fuel Specialist	Minister for Nuclear Industry
33. Yu Hongen(5) [0060 3163 1869]	60	Juxian, Shandong	University; Engineering	Coal Engineering Technician	Minister for Coal Industry
34. Ai Zhisheng(5) [5337 4249 3932]	59	Hanyang, Hubei	University	Political Cadre	Minister for Radio, Cinema, and TV
35. Wu Wenying(5) [0702 2429 5391]	56	Changzhou, Jiangsu	University; Engineering	Textile Management	Minister for Textile Industry
36. Yang Taifang(5) [2799 3141 5364]	61	Meixian, Guangdong	University; Engineering	Posts & Telecommunications Engineer	Minister for Posts & Telecommunications
37. Qian Yongchang(5) [6929 3057 2490]	55	Shanghai	University; Engineering	Transportation Engineer	Minister for Communications
38. Jiang Minkuan(5) [5592 3046 1401]	58	Wuxian, Jiangsu	Professional Training School; Engineering	Civil Engineer	Vice Minister S&T Commission, former governor Sichuan Province
39. Liao Hui(5) [1675 2547]	46	Huiyang, Guangdong	University; Engineering	Political Cadre	Director, Overseas Chinese Affairs Office
40. Wang Meng(5) [3769 3718]	54	Nanpi, Hebei	Middle School	Writer	Minister for Culture
41. Zeng Xianlin(6) [2582 2009 2651]	59	Anyue, Sichuan	USSR; Engineering	Economic Planner	Minister for Light Industry
42. Liu Hongru(6) [0491 7703 0320]	57	Yushu, Jilin	USSR; MA, Economics	Economic Planner	Vice Chairman, People's Bank
43. Zou Jingmeng(6) [6760 4552 5536]	59	Yujiang, Jiangxi	University; Engineering	Meteorologist	Director, Meteorological Administration
44. Li Xu'e [2621 4872 6759]	60	Hanyang, Hebei	University; Engineering	Astronautics Engineer	Minister for Astronautics Industry
45. Ye Rutang [0673 1172 2768]	48	Wenling, Zhejiang	University; Engineering	Architect	Minister for Urban & Rural Construction & Environmental Protection
46. Chen Haosu [7115 8504 5685]	45	Lezhi, Sichuan	University; Engineering	Political Cadre	Vice Minister for Radio, Cinema & TV
47. Li Shuzheng(6) [2621 3219 6927]	59		University	Political Cadre	Deputy Director, CPC International Liaison Department

Name	Age	Native of	Education at/in	Specialization	Position
48. Hu Deping [5170 1795 1627]	49	Liuyang, Hunan	University; Liberal Arts	Political Cadre	General Secretary CPC United Front Department
49. Wang Hanbin(5) [3769 3352 2430]	62	Huian, Fujian		Political Cadre	General Secretary, NPC Standing Committee
50. Ni Zhifu(5) [0242 1807 4395]	55	Shanghai	Sparetime University; Engineering	Mechanical Technician	Chairman, Federation of Trade Unions
51. Song Fude(5) [1345 4395 1795]	42		University	Political Cadre	1st Secretary, CYL Central Committee
52.Liu Yandong(5) [0491 1693 2639]	43	Nantong, Jiangsu	University; Engineering	Political Cadre	Secretary, CYL Central Committee
53.Chi Haotian(5) [6688 3185 3944]	59	Zhaoyuan, Shandong	Primary School	Professional Soldier	Chief of Staff
54.Yang Baibing(5) [2799 4101 0393]	60?			Professional Soldier	Director, PLA GPD.
55.Zhao Qinan(5) [6392 6386 0589]	55?			Professional Soldier	Director, PLA GLD
56.Xu Huizi(5) [1776 1920 3320]	52			Professional Soldier	Deputy Chief of Staff
57.Zhou Keyu(5) [0719 0344 3268]	55?			Professional Soldier	Deputy Director, PLA GPD
58.Zhang Lianzhong(6) [1728 6647 1813]	57			Professional Soldier	Navy Commander-in-Chief
59.He Qizong(6) [0149 0366 1350]	44	Yingshan, Sichuan	Polytechnical School	Professional Soldier	Assistant Chief-of-Staff
60.Zhou Guangzhao(5) [0719 0342 0664]	59	Changsha, Hunan	USSR; Engineering	Physicist	President, CAS

Appendix 2: CPC Central, Local Leadership and the Third Echelon

(24 February 1988)

1. Positions	2. Totals		3. Third Echelon Among Item (2)						
	Number	Average Age	Number	Percent	Average Age	College Education		Professional Qualifications	
						Number	Percent	Number	Percent
Politburo Standing Committee	5	64.6	2	40	59.5	2	100	1	50
Politburo Members	18	65.1	9	50	58.8	7	78	6	67
Members of the CPC Central Secretariat	5	57.6	4	80	56.0	4	100	2	50
Members of the CPC Central Committee	285	56.2	132	46	?	209	73	57	20
Premier, Vice Premiers of State Council	5	65.2	2	40	59.5	1	50	1	50
State Council Members	11	70.3	1	9	56.0	1	100	1	100
Ministers under State Council	45	60.3	30	67	56.9	25	83	21	70
Provincial Party Secretaries, Governors	58	?	48	83	(55?)	34	71	21	44

Note: a) The above table was compiled from sundry data in Communist Chinese newspapers and periodicals. Since there are discrepancies in data published by Communist China, there may be discrepancies in the ages given in the above table.

b) The average ages of the third echelon, data for the ratio of those educated at institutions of higher learning and of those with professional qualifications have been computed according to the total number of members of the third echelon.

c) The number of members of the third echelon in the column for members of the CPC Central Committee lists only those below the age of 55, while the actual number may be higher; the number of graduates from institutions of higher learning and of those with professional qualifications are statistics for the total number of all Central Committee members. The actual ratio of members of the third echelon could be somewhat higher.

d) Ministers of the State Council include the secretary general of the State Council, but not directly subordinated bureau directors and heads of offices.

e) Data in Chinese Communist publications on local leading cadres are uneven; in some places the figures are doubtful and need verification.

f) Professionally qualified personnel refers to civil engineers, geologists, architects, machinery specialists, economists and lawyers and doctors who hold licences.

g) There are no members of the third echelon among the leading cadres of the CPC Central Military Commission, the Advisory Commission, the Disciplinary Commission, or who are chairmen, or vice chairmen of the NPC.

9808

Overhaul of Supervisory System Urged

40050192a Shanghai SHIJIE JINGJI DAOBAO [WORLD ECONOMIC HERALD] in Chinese 28 Mar 88 p 13

[Article by Wang Jian [3769 0256]: "Traditional Supervisory System Must Be Overhauled"]

[Text] To prevent corruption of its power structures, a society may institute a system of horizontal checks. But this is often achieved at the expense of administrative efficiency. Alternatively, it may subject power to supervisory mechanisms and correct any abuses of power. The time has come for historic changes in China's supervisory mechanisms.

From one-way supervision to two-way—For over 2,000 years, supervision in China has always been one-way, from the top down. The supervisors were the higher authorities all the way to the emperor. The supervisory network blanketing the nation was only the son of heaven's eyes and ears. The Yusichaxing of the Qin Dynasty, the Yushitai of the Han and Tang Dynasties, and the Duchayuan of the Ming and Qing Dynasties were all well-organized institutionally and could attack all kinds of unhealthy trends from the top down. However, their fatal flaw was that they could not supervise and check the highest ruling power and hence failed to prevent major errors affecting the whole situation, which in the end had to be corrected through social upheaval.

To effectively prevent power from being corrupted at all levels, we must replace one-way supervision with two-way, paying particular attention to supervision from the bottom up, that is, supervision of the higher levels by the lower levels, of the leadership by the masses, of the state by the people. Essentially speaking, this kind of supervision is supervision of power by right, of the executor of popular wishes (public servants) by the people (master). Note that public servants are not self-appointed. As Rousseau said, "In no way are those appointed to exercise administrative power the people's master, only their officials. They can be dismissed as well as appointed at the people's pleasure. As far as officials are concerned, this is not a contractual matter, merely one of obedience."

From internal supervision to external supervision—Traditional supervision was supervision from the top down. In effect, it was internal policing by the power-holders themselves. While it managed to get rid of corrupt officials, etc., the basic purpose of this kind of supervision was to preserve the structural stability of the power system and safeguard the group interests of the ruling class. Although the country might be crawling with "inspectors" of all descriptions, they hardly made any difference. Besides, this kind of supervision was not under any scrutiny itself. Thus abuses of power in all forms and shapes got worse and worse. Only external, open, and permanent political supervision can really put an end to all sorts of corruption effectively. This inevitably requires that we step up different forms of social supervision, including supervision by public opinion, and gradually put together a complete supervisory process. What we have today—internal party supervision and supervision by government discipline inspection departments—is not enough. Powerful external supervision is needed as well.

From soft supervision to hard supervision—So-called hard supervision means the following:

1. Supervision standards should be scientific. We should differentiate clearly between the various levels of laws and regulations. Supervision standards such as party discipline, political discipline, and laws must be determined qualitatively and quantitatively. Concepts such as "using one's office to further private interests" and "unhealthy trends" must be clearly defined. Otherwise, muddled concepts themselves become loopholes that can be exploited.

2. Supervisory procedures should be legally protected. First, legislation and detailed regulations must be formulated to define the jurisdictional limits of supervision and lay down operational methods and procedures so as to give supervision itself a legal basis. Second, supervisory power must be protected by other appropriate legal institutional safeguards, such as the personnel system and the courts. Finally, the realization of the power of supervision must still depend on whether or not state

and political activities are opened up and on the formulation of coordinated detailed administrative regulations. The translation of the right of supervision provided for by the constitution into action often requires administration as an intermediary. Otherwise, it will remain an abstract power.

3. Strengthen the restraining function of supervision. Under socialism, we should, on the one hand, expose and condemn all conduct in violation of the law through the mass media. On the other hand, we should set up technical procedures to translate supervision into administration so that illegal conduct subject to supervision can thus be corrected. As long as supervision is not converted into administrative power, it will not be an effective social restraint. Such supervision is merely soft supervision.

Only by effecting the three major historic shifts mentioned above can supervision play an effective role as an important integral part of Chinese democratic politics.

12581

Proposal for NPC Committee Hearings

40050192b Shanghai SHIJIE JINGJI DAOBAO [WORLD ECONOMIC HERALD] in Chinese 28 Mar 88 p 13

[Article by Wu Xian [0702 0752]: "Hearings Will Make NPC Function More Effectively"]

[Text] Modern social life makes tougher demands on the National People's Congress [NPC] as a law-maker, supervisor and executor of other state functions. The NPC should lose no time in mastering major events at home and abroad and reacting promptly to the changeable international situation, internal emergencies, incidents involving social stability or seriously damaging the masses' interests, and cases of grave dereliction of duty on the part of state organs and personnel. Thus there is a need to establish a system of hearings by the NPC.

In representative systems overseas, hearings are usually conducted by special committees and ad hoc committees of inquiry to deliberate, investigate and inquire. In the United States, specialized standing committees and ad hoc committees of the two chambers of Congress regularly conduct hearings on government policies, the national budget, and major social and political events. After the hearings, a report will be made to Congress and conclusions arrived at. An impeachment motion may be put forward. Or a decision may be taken to approve or reject the chief executive's nomination for an important government position. In a socialist country, the parliament and its specialized committees too inquire and investigate through hearings. The Yugoslavian parliament is in session year-round. Apart from its specialized standing committees, the parliament itself often holds hearings to exercise its right to deliberate, investigate, and inquire.

Under the Chinese constitution, the NPC and its standing committee have the right to investigate and inquire in accordance with legally prescribed procedures. The NPC can also set up special committees and, if necessary, ad hoc committees of inquiry to study, consider, and draw up relevant proposals and investigate a matter. In practice, we have not made the most of these bodies. In particular, we have not made full use of hearings as a tool of inquiry and investigation.

Hearings are indispensable to the functioning of a representative institution and its deputies. The NPC is a large unwieldy body and meets but once a year instead of being in session constantly. Therefore, it is proposed that a hearings system be created for various special committees and committees of inquiry in order to strengthen the NPC's role in national policy-making and supervision. Accordingly, laws pertaining to special committees and committees of inquiry should be drawn up to establish their legal status, jurisdiction, organizational format, and work rules. By writing the hearing system into law, we will empower all NPC committees to carry out hearings as they consider the national plan and state budget, government policies, and nominations for top government posts and as they investigate major political and social issues and emergencies. Furthermore, based on the results of the hearings, the committees can submit a report or impeachment motion to the NPC and its standing committee. A hearings system will make the legislative process of the NPC and its standing committee more scientific, democratic, and efficient. Moreover, it will enable them to discharge their supervisory function more effectively and investigate and punish all behavior that violates the constitution and the law.

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Su Shaozhi Discusses Upcoming Research Activities

HK1005015388 Shanghai SHIJIE JINGJI DAOBAO [WORLD ECONOMIC HERALD] in Chinese 25 Apr 88 pp 1, 3

[Text] When talking with Mr Su Shaozhi, you will not have a feeling of estrangement. On the contrary, you will be immediately affected by his strong passion. The academic, who has been in the news on several occasions, has consistently been "concerned about the land under heaven."

One Saturday afternoon in early spring, I had the opportunity to visit Mr Su. After sitting down in his reception room, Mr Su first asked me for recent news about SHIJIE JINGJI DAOBAO and then asked after various friends he knows very well. Then in talking about himself, Mr Su, who was sitting on a sofa, patted his knees, saying that he had tripped and fallen some time ago and injured his legs but that they had fully recovered. He was about to go to London, at the invitation of Cambridge University, to conduct academic research for half a year. There he planned to write a book entitled "Studies on

Traditional Capitalism." Mr Su also disclosed to me that he had received similar invitations from some American universities and planned to make on-the-spot investigations and studies on the other side of the Pacific Ocean later, where he would write another book entitled "Studies on Modern Capitalism."

Mr Su said that the trip to the British Isles is in connection with topics to which he has devoted his time in recent years. If this is coordinated with the report he wrote while making an on-the-spot inspection of Eastern European socialist countries a few years ago, the framework of the topic of studies, entitled "Comparison and Study of Capitalist and Socialist Systems," which he conducted in cooperation with Li Honglin and others, will take shape.

He told me that he also planned to use new concepts to write a book entitled "The History of Marxist Development," in which he would explain in an all-round way the emergence, development, crisis, and rejuvenation of Marxism. In his view, although these questions are very important, it is unnecessary to write a heavy volume about them because few people care to read about such a heavy topic these days.

Talking about the method of studies, Mr Su bluntly criticized the prevailing practice of listing the figures (indexes) of our country and other countries or of different regions and comparing them in a oversimplified way. In his view, the method of comparing these simple figures cannot reflect the similarities and differences between some important, essential questions, such as ideologies, social systems, development patterns, and the quality of citizens. However, the prevalence of his method today shows the limitations of ideological methods in our society. This is something that merits our attention.

Although he is an academic who explored the concept of "the initial stage of socialism" at a fairly early date, he holds a differing view on the present practice of regarding the initial stage as a basket and putting everything into it. As he sees it, a more accurate formulation should be: "The initial stage of the commodity economy, namely, the initial stage of commercialization and socialization." Apparently, this is a major topic that confronts the theoretical circles at present.

In his talk, Mr Su also said: This is not the time to talk idly about the superiority of socialism. The most important thing is how to bring this superiority into full play. With the world developing to this age, there is a question of reunderstanding capitalism and socialism. He went to Greece a few years ago. Before World War II, the economic standards of Greece and Yugoslavia were about the same. But there is a widening gap now, with the per- capita income of the Greek citizen reaching $4,000. Similar problems also exist between Czechoslovakia and Austria....

At present, privatization is becoming a vigorously developing global trend. In our country some academics also hold that without private ownership there cannot be a genuine market or genuine commodity economy. Regarding such theoretical debates, Mr Su said: Because existing theories are still unable to thoroughly explain them, "instead of saying things, we can only do them." Take the "labor service market" as an example. It is not even possible to translate it into English. Why can't we just call it the "labor market" as in the rest of the world! There are other examples, such as, instead of saying unemployment, we use the term waiting for job assignment. All these have something to do with our lack or thoroughness in theory.

Before my departure, Mr Su readily complied with my request to find time in the midst of pressing affairs to write articles for the readers of this paper during his stay abroad. I wished him a pleasant journey.

NATIONAL AFFAIRS, POLICY

Report on Country's Economic Development in 1987

40060218 Shanghai SHIJIE JINGJI DAOBAO in Chinese 21 Mar 88 p 14

[Article in "Special Forum" column by the Comprehensive Studies Office, Chinese Restructuring of the Economic System Research Institute: "New Phenomena, New Methods, New Knowledge: Report on China's Economic Development in 1987"; author's name is illegible]

[Text] In the midst of reforms and opening up to the outside world, the Chinese economy is undergoing major changes, and many new phenomena have emerged. For example, in 1987, total domestic demand softened, but industrial output increased vigorously. Changes in supply and demand moved in opposite directions. Grain production recovered after a set back in 1985. Last year the demand for agricultural capital goods reached a 12-year record high, but the production of live hogs was at a record low. Consumption has kept pace with the increase in wages for people living in cities and towns, but savings, too, have increased 3.4 percent. This has attracted attention to changes in the wage structure of the workers. A tentative plan for a comprehensive industrial policy is still under study, but pressure due to incompatibilities in the industrial structure has already led to some modifications. It is imperative that we continue to modify the way we analyze the problems we observe, and try to understand the economic laws during the reform process more thoroughly. This report is an attempt to understand, over a longer time span, and in greater depth, the overall situation, the major issues, and the charateristic laws of economic development.

Import and Export Make Up a Greater Percentage of the Total Domestic Output Value in China Than in the U.S., Japan, and the U.S.S.R. This Has A Major Impact On China's Industrial Development.

China's economy has become increasingly internationalized. In 1987, import and export made up 30 percent of the country's domestic output value. This surpassed by far the levels in the U.S., Japan, and the U.S.S.R. Compared to the closed economy of the past, today's economic growth is increasingly tied to international trade. This implies that during economic expansion, domestic demands are very much dependent on foreign supplies, and the resulting international balance of payment problem inevitably requires some adjustments in domestic demands and foreign trade policies. China's industry has become a productive force to be reckoned with. As soon as we make the transition from importing to producing our own import substitutes, and increase exports, there will be added momentum for industrial production. Therefore, it is no longer appropriate to assess industrial growth based only on changes in investment and consumption; we must consider fully the effects of foreign trade.

The Time Lag in the Impact of Foreign Trade On the Industrial Economy

Imports can be categorized as either regular or cyclical. The former increases with normal economic growth, and the latter fluctuates with economic cycles (it increases with economic expansion, and decreases during recession.) Among the cyclical imports, machinery and equipment are the most elastic. They are over 10 times more volatile than the overall import rate. The import of machinery and equipment is affected by cyclical orders for goods, orders for processing jobs, and delivery dates. Any change in their import normally lags from 1 to 2 years behind economic expansion or recession. In 1980, investments were cut back, but machinery and equipment import reached a record level in 1981. In 1982, investments rebounded, but machinery and equipment import was reduced by half. In the latter half of 1985, investments receded, and in 1986, import of machinery and equipment again broke all records. In 1987, their import dropped by 26 percent. The volatility in machinery imports only increases the volatility in industry. A year after a retrenchment, investments slowed down, but the import of machinery and equipment increased significantly. Domestic industries were pressured by reduced funds and increased imports, and production inevitably fell precipitously—this explains the negative growth of the heavy industry in 1981 and its dismal performance in 1986. But by the third year, the cutbacks in imports of machinery and equipment resulted in increased orders for domestic industrial equipment, and heavy industry recovered.

Changes in Import-Export Trade and Agricultural Investments Stimulated the 1987 Industrial Growth. This Stimulant May Disappear This Year.

In 1987, the rate of increase in spending on material goods for investment purposes fell, but, at constant prices, the GVIO was 5.7 percent higher than in 1986. Sales were good, and inventory was normal. This contradiction between supply and demand was due mainly to less importing, which led to greater domestic demand, and more exporting, which increased foreign demand. Analysis of the structural change in the demand for final industrial goods shows that in 1986 industries grew by 8.8 percent, but only 1.6 percent of that was attributable to fixed asset investments, and 3.6 percent was absorbed by inventories. Total imports (excluding the three forms of import processing and compensation trade) fell in 1987; the import of machinery and transportation equipment fell most sharply, and assembly line imports also decreased, but more key installations were completed domestically, and many essential investment-type equipment were manufactured at home. Despite a 3 percent drop in investments, increase in demand for domestic mechanical and electrical products was responsible for

4.8 percent of the industrial growth. Increase in exports of industrial products, especially textiles, increased industrial growth by another 2.9 percent. In 1987, almost half of the 14.6 percent growth in industry was brought about by increased foreign trade. At the same time, 1987 saw a record demand for agricultural capital goods; 1.5 percent of the industrial growth was attributable to this source. Consumption and inventory had much less effect on industrial growth compared to the years 1984 and 1985. We should be aware of the temporary nature of the changes in foreign trade and resumption of agricultural investments and other factors which speeded up the industrial growth in 1987. This year's import volume will stablize. The short-term stimulant triggered by the purchase of Chinese-made equipment instead of imports will soon disappear. The increase in our exports may slow down due to conditions in the world market and export quotas. Agricultural investments will at most be at last year's level. Even if this year's investment and consumption rates remain unchanged, industrial growth will be slower than last year. We must not estimate this year's output and income increases based on last year's sales, profits, and local revenues.

Thorough Rural Reforms Are Necessary to Avert Fluctuations in Grain and Hog Production

The decline in the production of grain and hogs has triggered much debate over agricultural issues. Agricultural development, to some extent, depends on such measures as protecting the farmland, improving agricultural and farm infrastructures, and increasing inputs. But ultimately, it is up to the peasants to implement these measures. Agricultural policies in essence are ways to mobilize the enthusiasm of the peasants. Agricultural products are commodities. How much the peasants should increase their labor and material inputs depends on market signals and market conditions. In our study, we have discovered a distinct cyclical relationship between the market price for grain and grain production. This year's supply and demand for grain prompts the peasants to adjust their stockpile, and in turn determines next year's market price, and next year's price determines the peasants' enthusiasm and the amount of essential inputs needed for grain production in the third year, and these factors will change grain output in the third year. The market price in the fourth year reflects this change. There is a 1 to 2 year time lag before production reacts to price change, and vise versa. Other factors may modify the duration of the cycle, and shift the peaks and valleys slightly, but generally there is a 4 to 6 year lag between a low point in production and a high point in the market price.

The production of hogs is regulated not only by the market price of hogs but also by grain prices (peasants calculate the cost of raising pigs based on the market price of grain.) Whether the peasants want to raise more pigs than they can sell to the government depends on the ratio of the market price for hogs to feed price (hog-feed price ratio.) A high ratio indicates high hog prices and cheap feed prices, and more pigs will be raised and marketed in that year and the next. A low price ratio indicates low hog prices and high feed prices. The pigs will be sold sooner, there will be more hogs in the market that year, and this lowers the demand for feed. It is impossible to assess the net gain from increasing hog production based on the absolute prices of hogs or grain. Only the price ratio can reflect the net gain so that hog production can be adjusted.

Hence, there is a cyclical relationship between hog and grain production. Failure of government procurement policies, foreign trade, and the consumers to adjust to this agricutural production cycle, and flaws in the system and policy mistakes often amplify the fluctuation in hog and grain prices and output. High grain price and low hog production in 1981 led to record grain harvest, higher hog price, and increased hog production in 1982. At that time, the income of the urban population was stable, and demand for pork was limited. In 1983, less pigs were raised, and at the same time, bumper grain harvests in 1982 and 1983, together with a high volume of imports resulted in a sharp fall in grain prices and a sharp rise in the hog-feed price ratio in 1984. This led to a reduction in grain output, but a sharp increase in hog production in 1985. In the same year, a system of contracts with the procurement price determined by using the inverse 3:7 ratio for grain was implemented which lowered the purchase price of surplus grain, and further suppressed grain production. At the same time, we had turned our net import of grain into a net export, and raised the market price of grain, and lowered the hog-feed price ratio in 1986. Thus, in 1987 grain production increased, hog production decreased, the grain price stablized, and hog prices rose sharply. At present, grain output is still on the rise; autumn sowing has increased acreage by 3.7 percent. Because the hog-grain price ratio has rebounded, the production of hogs has also resumed. Ups and downs in hog and grain prices and production are normal. Temporary reduction in output does not imply an agricutural crisis. The question lies in how to avoid excessive fluctuation.

In an imperfect market, we must allow the law of value to regulate agricultural production as much as possible. On the other hand, we must extend better guidance, and provide better conditions to stablize agricultural development. For example, state purchase prices should be flexible rather than inflexible and slow to react to market conditions. We should provide better guidance in terms ofm information. We need to reduce fluctuations in agricultural production and agricultural structure and increase the scale of operations. We need to develop a futures market and use futures prices to regulate spot prices.

In Exercising Macroeconomic Control, We Must Coordinate Planned Management With Monetary Policy. Merely Calling for "Loosening Up" or "Tightening Up" is Not Enough.

As the overall price level continues to rise, and the economy "heats up" and "cools down" sporadically,

stronger macroeconomic control is imperative. Imitating the west, or simply making macroeconomic control the coordinator between financial and credit policies will not work in this country. Under the present two-track system of planned management and reliance on the market's regulatory effects, monetary policies cannot alone do the trick. The flow of money is partly determined by such policies as state procurement and sale of agricultural commodities, wages, and plans for central distribution of materials and resources, investments, foreign trade and foreign exchange, and so on, to some extent, determine the circulation of a portion of the money supply. The banks are left with limited ability to regulate independently only a portion of the money supply (a passive monetary policy is a monetary policy in the narrow sense.) To reduce overall demand, we must keep the bank's narrow monetary policy in line with the many policies and plans within the planned management system. Lack of coordination will certainly lead to conflicts and loss of macroeconomic control. Planned management often encounters urgent problems, and the solutions to these problems may not meet the objectives of macroeconomic control. Then we must weigh the overall pros and cons. Slogans of "more control" or "less control" are useless.

Rural Reform, Change in the Distribution of the National Income, Pattern of Urban Consumption, And the Overstaffed State-Run Business System Push up Agricultural and Sideline Product Prices In the Cities

Prices for agricultural and sideline products were low in the cities because the peasants had always been very poor, and also because of huge government subsidies. Today, these conditions no longer exist. Our city dwellers enjoy housing, utilities, education, health care, transportation, and many social welfare benefits. The people need to spend little of their own money. More money basically means spending more on food and clothing. As incomes rise, more people purchase durable goods, and their demand for the mix of food products also changes dramatically. People consume more non-staple foods, and demand better quality. The demand for agricultural products increases. The per capita arable land in China is only 1.5 mu, and food supply can increase only slowly. This means the production of meat, poultry, and eggs, as well as fruit and vegetables, which take up cultivated land, cannot sustain long-term rapid increases. Excess demand for foodstuff inevitably causes prices to rise.

Because the market price of foodstuff is rising rapidly, many cities have resumed using state prices, but even the state prices are rising. This is because the state-run non-staple food business is shrinking, but the number of employees has not been reduced, and wages and bonuses continue to increase, directly causing the state price to rise.

Disparities In Bonuses and In-Kind Allocations Generate New Social Conflicts

In recent years, the workers are earning more money not because of higher basic wages, but because of bonuses, extra-pay, and in-kind allocations handed out by the units. In 1987, income outside of the regular wages of urban workers increased 30 percent. This is why savings have increased despite increases in consumption which kept pace with higher wages. Therefore it is no longer appropriate to use basic wage or the total wage bill to measure the income level. In analyzing the effect of price increase on the people's living standard, we must analyze all the different kinds of income. However, there are great disparities in the amount of bonuses, extra-pay, or in-kind allocations between different units and among individuals. Some of these disparities are socially unjust, and have created new conflicts. The real income of some families has declined slightly last year.

Enterprises, Departments, and Local Governments Are Actively Participating in the Structural Adjustment of Industries

A tight economy increases pressure on those enterprises which produce goods in abundant supply or goods of poor quality. This pressure is transferred from enterprises to government. Not only are many enterprises forced to reconsider their product mix, but the investment policies of many local governments and enterprises are also affected. There are fewer choices for investments in the processing industry. The market sends strong price signals of goods in short supply, and this makes it more likely for new investments to shift gradually from the processing industry to the more advanced industries. In the past year or two, some enterprises, departments, and local governments have begun to react more positively, and taken steps to adjust the product mix and investment structure, although others are still waiting passively, or looking for opportunites aimlessly. Some industries (like the cotton and textile industries and scrap steel industry) have become increasingly incompatible in structure. But initial local reactions are positive, and show that some of these conflicts can be mitigated.

For example, in Hubei and Fujian, departments and committees in charge of light industry, mechanical, textile, and other industries have enacted guiding policies and decrees which, to various degrees, reflect the ideology of our industrial policy. There is increasing enthusiasm for developing the raw and processed fuel industries through joint investments, and locally owned funds are converging gradually on the more advanced industries. In 1987, a significant proportion of the people's capital construction investments was in raw and processed materials and energy. Supply and demand conditions of goods in chronic short supply have changed dramatically. The acute shortage of coal, cement, and plate glass has been eased. Output capacity for iron and steel, electricity, aluminum, and B [XI] has increased significantly, and more parts and components are being manufactured in this country.

Failure to Restructure the Existing Assets Slows the Readjustment of the Industrial Structure. This Should be the Next Task for Economic Development and Reforms.

Our present structural adjustments still focuses on increasing assets, and restructuring the existing assets has been slow. The mechanism for structural adjustment is three-pronged: key construction within the plan, administrative intervention in extra-plan investments and product mix, and market pressure and inducement. The first two measures do not give play to competition, and there is little macroeconomic guidance for the latter. This kind of mechanism does not lead to fundamental change. As a result, the cost of structural adjustments has been high, the return on investments in key construction is poor, administrative interventions miss market signals by a wide margin, and actions tend to be taken blindly. If structural adjustments are to be made such that the market is a powerful factor, we often have to pay a high price in terms of resource allocation. At the same time, technological advancement is still heavily dependent on imports. The goal of speedy technological progress runs at odds with our desire to keep a healthy balance of payments.. These are problems that need to be solved in our reforms.

(The full text of this report will appear in ZHONGGUO: FAZHAN YU GAIGE [CHINA: DEVELOPMENT AND REFORM] Vol. 4, 1988)

12986

Closing Gap With Industrialized Countries

40060217 Shanghai SHIJIE JINGJI DAOBAO in Chinese 7 Mar 88 p 8

[Article by Liu Jirui [0491 0679 3843], of the Economics Institute, Zhejiang Branch, Chinese Academy of Social Sciences: "We Cannot Keep Bragging About Our 'Great Country, Vast Territory, and Abundant Resources,' But We Must Not Become Disheartened Because It May Take More Than 100 Years to Close the Gap."]

[Text] A SHIJIE JINGJI DAOBAO reporter's year-end commentary issued the warning that "the Chinese nation is again faced with its greatest danger," based on the fact that the gap between China and the developed countries, and even some developing countries, is widening. To every Chinese intoxicated by the festive atmosphere of the year of the dragon, this warning is no doubt a shock strong enough to rouse the deaf and awaken the unhearing. I want to add that judging by the modernization process a backward country must go through to catch up with the developed countries, the challenge China is faced with may be even more rigorous. In terms of official exchange rates, in 1980, the per capita GNP was about $10,000 in the Western developed countries and $300 in China, about 30 to l. Acccording to World Bank estimates, even after adjustment for possible distortions and errors caused by the official exchange rates, the per capita GNP of the Western developed countries is still at least 10 times that of China. With a gap between 10 and 30 to 1, how long will it take for China to catch up with and overtake the developed countries? For answers, I recently conducted a study.

1. If, from 1980 on, the per capita GNP maintains zero growth in the developed countries but grows at an annual rate of 5 percent in China, it will take 47 years for China to close the 10-to-1 gap, and 72 years to close the 30-to-1 gap. In reality, neither is possible.

2. If, from 1980 on, the per capita GNP grows at an annual rate of 2 percent in the developed countries (based on the growth trend in the first 100 to 150 years of modern economic development of the Western developed countries), and at an annual rate of 5 percent in China (based on the growth trend between 1960 and 1982, and the goal of China's economic growth for 1980 to 2000), then it will take China 79 years to close the 10-to-1 gap and 121 years the 30-to-1 gap. This assumption has some empirical basis.

3. More optimistically, if the growth rate is 2 percent in the developed countries, and 6 percent in China (the per capita GNP increased at a 6.8- percent annual rate between 1979 and 1984), then it will take China 60 years to close the 10-to-1 gap, and 91 years the 30-to-1 gap.

4. More pessimistically, if the growth rate is 3 percent in the developed countries (which is slightly lower than the 3.3-percent average growth rate between 1960 and 1982), and 4 percent in China (based on the growth trend between 1952 and 1982), then it will take China 238 years to close the 10-to-1 gap, and 363 years the 30-to-1 gap.

5. To put it in another way, if China is to spend 100 years (about what Japan took to catch up with the Western developed countries) to catch up with the developed countries by 2080, and if the per capita GNP of the latter grows by 2 percent each year, how much must China's per capita GNP grow each year? The answer: 4.38 percent to close the 10-to-1 gap, and 5.64 percent to close the 30-to-1 gap.

In short, it may take us 100 to 150 years, starting from 1952 when China's modern economic development began, to catch up with the Western developed countries in per capita GNP. This is indeed an economic marathon. In the face of the world at large and the shocking gap before us, we have no reason to continue bragging about our "great country, vast territory, and abundant resources," but neither should we become disheartened because it will take four or five generations and more than 100 years to close the gap. We must honestly recognize the fact that we have fallen behind temporarily, keep cool-headed, work hard in the face of adversity and crises, and press forward step by step.

At first it seemed that China has fallen so far behind the developed countries because it had a low rate of economic growth in the past few centuries, especially the century after 1984, a late start in modern economic development, and a low per capita GNP to begin with (in 1952, when China's modern economic development began, it had a per capita GNP of just $58 in terms of 1957 dollars). However, modern history since the Opium War tells us that the real problem was that China lacked a whole set of systems and arrangements for the development of a modern commodity economy and promotion of highly efficient and fast economic growth, that is, a development mechanism for sustained expansion of reproduction consisting of mechanisms for capital accumulation, technological progress, organizational renewal, structural change, and development of human resources. Under the circumstances, even though history has given the Chinese nation many chances to take a turn for the better and catch up with and overtake the developed countries, we have missed them all, and the struggles waged by countless people with lofty ideals have ended in disappointment. The experience of other countries in catching up and overtaking the Western developed countries has shown that by establishing a system which combines effective government intervention with market forces for the development of a modern commodity economy, a country will be able to respond quickly to fleeting development opportunities and catch up with the Western developed countries at an extraordinarily high speed, even though it may be seriously handicapped by capital shortage, lack of competent people, heavy population pressure, backwardness in technology, and poverty.

To establish a system for the development of a modern commodity economy, a country or area usually has to go through major economic and social changes. The high-speed economic growth in post-World War II Japan, South Korea, and China's Taiwan Province, known as the "East Asia miracles," is all marked with varying degrees of economic and social readjustments and reforms, not to mention Japan's Meiji Restoration and Russia's 1861 reform in the early period of modern economic development. Without the postwar "democratic reforms" and the "Dodge Plan", Japan could hardly have achieved the high-speed economic growth in the 1960's and 1970's. It is equally improbable that South Korea and Taiwan Province could have made the strategic move from producing substitutes for imports to producing goods for export and brought their economy onto the path of sustained growth, without large-scale reforms of their financial and monetary systems.

Since the founding of the People's Republic of China, a government with modern ideals has mounted the historical stage, carried out a series of institutional reforms, and opened the way for modern economic development. China's achievements in industrialization and elimination of poverty in the past 30 years and more have caught worldwide attention. However, there is no need to deny that owing to "leftist" mistakes and the rejection of the role of the market mechanism by the traditional system, the gap between China and the Western developed countries has not been reduced very much, and in some fields the gap has even widened. What's more, following Japan and the Soviet Union, some developing industrial countries and areas, as the third echelon of modernization, have moved ahead of us. Even Thailand and Malaysia are developing rapidly, striving to catch up as the fourth echelon. In the face of the situation, China cannot hesitate any longer. The only choice is to accelerate the structural reform, which has begun since 1979 and is still developing in depth, and establish a new economic mechanism which combines effective government control with market forces as quickly as possible. True, it will take a long time to develop a rational relationship between commodities and currency in a developing country, and modernization cannot be accomplished in 1 day. We must guard against impetuosity and rashness. It is equally true that the structural reform of the economic and social systems is a noncontinuous process and must be accomplished by stages, and if we let a golden opportunity for reform slip away, it will be lost forever. We must have a sense of urgency, act boldly and with confidence, quicken our pace, and waste no time. There is no precedent in the history of the world economy of a long-drawn-out attempt at reform that was crowned with outstanding achievements after dragging on for years and even decades.

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Consumption Demand in 1987 Analyzed

HK0605151088 Shanghai SHIJIE JINGJI DAOBAO in Chinese 18 Apr 88 p 6

[Article by Ni Di (0242 6611) and Guan Jingru (7070 2417 1172): "An Analysis of the State of Consumption Demand in 1987"]

[Text] A research report on the state of consumption demand in 1987 reached the following conclusion: In general, the situation in 1987 was good, and the excessive growth in the total consumption demand was restrained to a certain degree.

This conclusion was based on the following data: The growth rate of the income of urban residents declined from 20.8 percent in 1986 to 10.6 percent in 1987. With the price rise factor being deducted, their income increased by 1.7 percent in real terms. The growth rate of the workers' average wage fell from 16 percent in 1986 to 9.2 percent in 1987, and real wages increased by less than 1 percent. In addition, the total amount of nominal wages increased by 12.4 percent in 1987, and this growth rate was also lower than the growth rate of 20 percent in 1986 and 1985. The growth rate in real terms was 3.7 percent. The labor productivity of state-owned industrial enterprises grew by 7.6 percent, and the national income increased by 9.3 percent. The growth rate of average

nominal wages was higher than that of labor productivity, and the total amount of nominal wages was larger than the national income, but the total amount of real wages was smaller then the national income.

The report pointed out that the consumption demand was restrained mainly through the control over wage growth. Wages accounted for just 18-19 percent of the national income, and accounted for 30 percent of the consumption fund, and this was the part which could be controlled most easily. In addition, we cannot only view the wage increase in a single year; instead, wage increases over a number of years should be viewed as a whole. Because we did not build the coordination mechanisms to link wages with production development but just determined the wages according to policies, after substantial wage increases for 3 years running, it was natural that wages did not increase so rapidly in 1987. Even so, workers' non-wage incomes had increased to over 40 percent of their wage incomes, and the growth rate of the non-wage incomes was 20 percentage points higher than the growth rate of wage incomes. This was also a noticeable problem. Moreover, the consumption of social groups increased sharply and added much to general consumption demand. This consumption increased 2.7 times between 1978 and 1987. About one-third of the income increase in 1987 was caused by the farm product price rise (the growth rate was 12 percent). Therefore, the state of the consumption fund has not been completely restored to a healthy condition.

The report pointed out that on the one hand, the consumption demand was mitigated; on the other hand, the potential for excessive consumption growth remained unmoved. So we must not loose our vigilance. A crucial factor for instability was the unevenness of people's incomes. First, in state enterprises, wages increased faster than the growth in tax-profit contributions; second, the income gap between different trades and enterprises was widening; and third, the income gap between individuals was also widening. The unevenness also found expression in the following facts: First, the purchasing power of social groups increased quickly, while the income of residents increased slowly. Second, the income of new industries, such as the petroleum and chemical industries, increased quickly, but the income of the old industries, such as the textile industry, increased slowly. Third, the income of reform experiment units increased quickly, while that of units remaining in the old structure increased slowly. Fourth, the income of rural people engaged in service and transport industries increased quickly, but the income of those engaged in agriculture increased slowly. Fifth, the income of people engaged in manual and mental work increased at different rates. Among mental workers, those engaged in applied researches increased their incomes faster than those in administrative organs. Sixth, the income of enterprises with foreign economic relations increased faster than that of the enterprises without such relations. Seventh, individual traders could gain a much higher income than ordinary residents.

Such unreasonable and unfair distribution of incomes brought about a structural swell in consumption demand. When consumption demand remawned high, 46 percent of urban households saw a decrease in their real income, and a large percentage of residents found that their living standards were declining. (About 21 percent of total households in cities found that their real incomes decreased due to price rises).

In view of this state of affairs, the report proposed the following countermeasures and hopes:

First, in 1988, the management of consumption demand should be focused on the adjustment of the consumption structure. Resolute measures should be taken to reduce the purchasing power of social groups. At the same time, the reform of the housing system and the medical insurance system should be quickened so as to rationalize the expenditure structure of consumers and to change the welfare subsidies given by the gmvernment. Meanwhile, it is necessary to improve the investment policy and open more investment channels. Securities markets and investment markets should be opened. Thus, the consumption funds can be turned into accumulations. Consumption taxes can be imposed to restrain consumption, and can also turn individual consumption funds into funds that are concentrated in the hands of the state.

Second, income unevenness used to be a factor that stimulated people to seek high incomes. This was both a reasonable and an unreasonable factor. It is not realistic to rely completely on the government to complete the structural adjustment. In 1987, the per capita national income was 854 yuan, and this indicated that little room was available for adjustment. We should open the labor market and reform the employment system so as to create a socioeconomic environment which provides equal job opportunities to more people.

Third, a long-term plan should be worked out to adjust the increase in consumption and income. The reform of the wage system and income increases should all be included in the overall reform and development plan. Consideration should be given to the enhancementlof the people's living standards and to the necessary accumulation for expanding production and the need to guarantee long-term economic development. At the same time, it is necessary to study some transitional measures to coordinate income policy with price reforms and the reform of the macroeconomic and microeconomic mechanisms so that incomes, wages, and economic results can be regulated and controlled in an integrated system at different levels in the transition of the old system to the new system. In the last 3 years of the Seventh 5-Year Plan, we should mainly stabilize wages, and at the same time, control non-wage incomes and welfare expenditures. As wages and the national income will grow at a comparatively low rate, we should prevent wages from increasing too fast this year and in the next 2 years, and should try to maintain balanced increases.

Fourth, the main problem in the state of consumption demand came from the gap of 40 billion yuan between the purchasing power and the supply of commodities. As there is no developed investment channel, savings will be the main form of absorbing people's surplus purchasing power. However, the average interest rate for savings in our country is 7.4 to 7.5 percent. If prices rise at the rate of 7 percent a year, the interest rate is too low, and the savings interest rate may become negative in real terms. This is a factor that affects the stability of savings. So we should consider increasing the savings interest rate; otherwise, the 40 billion yuan of surplus purchasing power will inevitably push the prices up and raise the price index by 4 to 5 percent.

Developing of Real Estate Industry Urged

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[Article by Ma Biao (7456 7516): "A Probe Into the Development of China's Real Estate Industry"]

[Text] With the transformation of China's economic development strategy and economic structural setup, the real estate industry, a trade which has been neglected for a long time, is rising rapidly. How to proceed from the practical needs in the reform of the housing system and to develop our country's real estate industry according to the principle of the socialist planned commodity economy so that it can become a pillar industry of the national economy is an important issue which should be conscientiously studied and explored.

The Great Significance of Developing the Real Estate Industry

The real estate industry includes the development of land, the construction, repair, and management of houses, the paid allotment or transfer of land use right, and the purchase and sale of houses, as well as the real estate market thus formed. In China, a necessary condition to ensure the smooth implementation of the reform of the housing system is to develop the real estate industry so that its enormous wealth can enter the circulation field and achieve a benign cycle between input and output.

For a long time, instead of regarding the housing funds in cities and towns as consumption funds and incorporating them into the total wages, we have regarded them as accumulation funds and implemented a system of unified construction and distribution toward urban housing, collecting only a very low rent. This non-commercialized, welfare-type housing system has serious defects, which find concentrated expression in the absence of the self-circulation mechanism of housing funds and the self-restriction mechanism of housing demands. This has not only led to housing shortage and irrational distribution but also made it difficult to adjust the consumption pattern and industrial structure.

Now, the reform of the housing system has been placed on the important agenda of economic restructuring. The objective of the reform of the housing system is to commercialize housing, namely, in line with the requirements of the socialist commodity economy, to make housing enter the consumer goods market as a commodity, where the users purchase or rent housing through commodity exchanges and achieve a benign cycle of the input and output of housing funds, thus opening up a new path for solving the housing problem in cities and towns. It is important, urgent, difficult, and complicated to effect this change.

Housing commercialization is, in essence, a major pricing reform. At present, the greatest obstacle to housing commercialization is the excessively high selling price of new houses. According to statistics, since 1984, the price of urban commodity housing has risen at an average of about 15 percent annually. Now, the price of urban housing is generally more than 500 yuan per square meter of building space. The highest price exceeds 1,000 yuan and it is even higher in large cities. The soaring price of commodity housing has greatly exceeded the capability of urban workers and staff members to withstand the strains and hindered the commercialization process of housing.

The principal cause of this is the extremely irrational housing price composition and the sharing of excessively large extra investment expenses. The current price of housing is called the "comprehensive development price of housing construction" or "comprehensive construction cost." Into the cost of commodity housing it has incorporated, in the form of coordinated charges, various items which should have been invested and built by city governments or various departments, such as urban, cultural, educational, sanitation, and sport facilities and shops, as well as public security, administrative (neighborhood offices), and welfare facilities. For various reasons, such as an increasing number of supporting projects, the constantly rising criterion of housing construction, and the rising prices of building materials, the price of commodity housing has soared. This method of using "comprehensive construction cost" as the selling price of housing is irrational.

According to the socialist theory for the distribution of national income, in addition to the distribution of personal consumption among workers and staff workers, it is also necessary to deduct something from the newly created value by the material production department, which is to be used to develop economic, cultural, public health, and sports undertakings and to pay for administrative management and social welfare charges. Such being the case, when the workers or staff members use their salary income to purchase housing, which is a necessity of life, they do not have to pay for the cost of building the supporting facilities again. It is even more unreasonable to incorporate the cost of building shops, which have their own operational incomes, into the cost of commodity housing.

Strictly speaking, the housing price should only reflect the value of housing construction, including various factors, such as the cost of building and installation and the cost of requisitioning land, as well as the credit interests, management charges, and the profits of the operational units. In consideration of the economic capability of urban workers and staff members to withstand the strains, the price of commodity housing sold to individual workers or staff members should only be fixed according to the cost, including the cost of construction and installation and the compensations paid for the dismantling of the workers' houses and their removal. The cost of building other public facilities, the construction taxes, the funds for key energy and transport construction projects, and so on, should not be incorporated into the selling price. Moreover, the gap between the selling prices of second-hand houses and new houses should be appropriately widened. The former can be calculated at a discount according the construction prices of new houses. Furthermore, it is also necessary to adopt preferential measures toward the workers and staff members who purchase houses. A precondition is that the source of capital for urban infrastructure should be solved.

The urban infrastructure is the basis of urban economic operations. It is also a precursor of urban housing construction. The present urban infrastructure in our country, including the supply of electricity, water, heat and gas, flood prevention, roads, bridges, public transport, afforestation, and environmental sanitation, is generally conducted through state investment according to overall plans. Due to the implementation of a low-price policy over a long period of time, particularly the policy of the free use of urban land, the country has not derived appropriate compensation from this investment. The state has to annually increase investment in urban infrastructure to suit the constantly expanding needs of the cities. However, given the present strained economic conditions, it is impossible for the state to drastically increase special funds for urban infrastructure. A fundamental way out is to do something about the problem by implementing a policy of the paid use of urban land. That is to say, the state, as the proprietor of urban land, may rent the land to enterprises or individuals for a certain period of time through tenders or agreements and to collect land use charges (land rent) from the land users so that the land investments can make self-circulation and the land can genuinely be supported with the land income. This is an effective way to solve the question of the source of capital for urban infrastructure.

In short, it is necessary to integrate housing property and landed property, to integrate the circulation mechanism of housing fund with the circulation mechanism land fund, and to develop China's real estate industry so that it can accumulate funds and develop on its own and gradually form a benign cycle of input and output in real estate funds.

Favorable Conditions for Developing Real Estate Industry

There are many favorable conditions to develop China's real estate industry. With the vigorous development of China's socialist commodity economy, the demands for real estate by all trades and professions and residents have drastically increased.

According to some calculations, to achieve the grand objective of China's economic and social development by the end of this century so that the people can be comparatively well-off both materially and culturally, it is necessary for cities and towns to build or rebuild housing with a floor space of over 3 billion square meters, as well as buildings for the purpose of industries, transport, commercial services, culture, education, and public health, and offices, with a floor space of over 2 billion square meters. That is to say, it is necessary to build various types of houses with a floor space of 400 million square meters a year. Moreover, with the accelerated course of urbanization and the key role of cities being increasingly brought into play, new and higher demands have been set for various infrastructure, such as the supply of water, electricity, heat, and gas, the drainage pipelines, roads, public transport, afforestation, and environmental sanitation. It is estimated that by the end of this century, it will be necessary to develop and redevelop about 10,000 square km of new land for urban use. Under such circumstances, there is a tremendous and steadily growing social demand for the development and operations of the real estate industry and there is a broad market for it.

The extensive comprehensive development of urban construction has considerably stimulated the development of the real estate industry. At present, there are over 2,400 real estate development enterprises of various types throughout the country. They have spread to almost all cities and have sold large numbers of commodity houses to units and individuals. The breakthrough made in the reform of the housing system has stimulated the process of housing commercialization. The paid use of land at different levels has created conditions for the land use right to officially enter the market. In the country as a whole, more than 100 cities have completely or partially collected charges for land use. Shenzhen and other special economic zones and the coastal open cities have been permitted to implement on a trial basis the practice of allotting or transferring the right to use land with payment. The state proprietorship of land is being gradually confirmed and realized in economic terms. The real estate business operations have been expanding from the previous exclusive registration of the buying and selling of private houses to numerous comprehensive business, such as land development and operations, the sales and advance sales of commodity houses, the buying, selling, and renting of second-hand houses, trust house exchange, decorations, and repair services. Moreover, real estate trade centers

have been set up in 167 cities throughout the country. In most cities, real estate transactions tend to rise and the transaction volume has sharply and steadily grown.

More important, after 30-odd years of construction, China's real estate industry has developed to a considerable scale. According to incomplete statistics, the cities and towns have public housing with a total building space of 2.4 billion square meters. Moreover, the developed urban areas of the cities throughout the country amount to more than 10,000 square km. Such an enormous amount of fixed assets can provide a fairly solid position for the development of China's real estate industry.

A General Concept for Developing the Real Estate Industry

Based on the above-mentioned analyses, the general concept for the development of our real estate industry can be summed up as follows: Proceed from the conditions of China's economic development at the present stage, suit the requirements of the socialist commodity economy, comprehensively develop the real estate industry, and promote the transformation of the real estate industry from a non-commodity economy to a commodity economy, so that it can accumulate and develop itself, gradually develop a benign cycle of input and output in real estate capital, provide residents, enterprises, and other institutions with economic, suitable, and beautiful housing and with production and work buildings, as well as a fine living and investment environment. The principal policies are as follows:

1. Set up real estate funds to ensure a stable source of funds for the development of real estate. Like other industries, the real estate industry should achieve a benign cycle of input and output and need a certain amount of capital as a starter. Now, the total amount of funds used by the state and state-owned enterprises and other institutions in housing construction, repair, and management, as well as rent allowances, is over 20 billion yuan a year. This should be "channeled, changed, and straightened out" so that a considerable portion of the funds can be rationalized, fixed, and standardized. Moreover, the nation's cities and towns have public housing with a total floor space of 2.4 billion square meters. Calculated at the current price of 150 yuan per square meter, it is worth about 290 billion yuan. After deducting some portions which should not be sold for the time being, we can at least recover 10-20 billion yuan a year by selling these houses group by group. Furthermore, on the basis of state ownership of urban land, we may institute a system of the paid use of land. By collecting in an all-round way payment for the use of urban land, namely, land rent, we can collect about several billion yuan a year. These funds may be used in urban construction and in land development, improvement, and management, including the development and operations of real estate, but they cannot be used for other purposes. They should be managed in a centralized way by the relevant financial institutions which control their use.

2. Organize and set up the state real estate investment and development companies to comprehensively develop real estate. In the world today, the real estate industry is one yielding fairly high output or return. In many fairly developed countries and regions it is regarded as an important economic pillar and is organized or supported by the government in terms of investment and development. In our country, the setting up of the state real estate investment and development companies can help channel, change, and straighten out the original housing funds from various channels. They can also manage and use well the enormous funds from the sales of residential housing, as well as the funds for the construction of urban infrastructure, and make a success of the development and operations of real estate. Moreover, by setting up the state real estate investment and development companies we can correctly guide and indirectly control the development of real estates through competition, genuinely bring them into line with the planned commodity economy, comprehensively develop real estates, and provide reliable guarantee and support.

3. Open and set up real estate markets and turn them into an organic component of the socialist market system. A complete real estate market is the sum total of the house property market and the landed property market, including the paid allotment and transfer of the land use right, the renting, buying, and selling of houses, and the mortgage of real estates. This is the key to enabling the enormous wealth of the real estate to enter the circulation field and to preserving and increasing value through a circulation characterized by "input—output—input." Given the socialist planned commodity economy, the right to use land can be transferred with payment and houses can be rented, purchased, or sold. Where conditions permit, especially in the special economic zones, the economic and technological development zones, and the coastal open cities, credits can also be granted with real estate as a mortgage. In addition to working out methods, policies, and regulations to manage the real estate market, city governments should also, in light of the overall conditions of the real estate market, work out a price and grade standard and, through the tax collection and the methods of collecting progressive charges according to a certain percentage of the transaction amount, control transactions in real estates. Illegal buying and selling, profiteering, and the practice of seeking exorbitant profits are strictly forbidden.

4. Set up real estate banks and turn them into clearing and credit centers for the real estate industry. The real estate industry needs a lot of investment and a long cycle. From land development to the construction, rent, and sale of houses, it cannot do without the coordination and support of the banking trade. According to the existing banking structure, all specialized banks exercise vertical

management and deliver their profits to the higher authorities from one level to another. But most of the real estate capital comes from, and is used in, the localities. If this capital is divided up and used by various specialized banks or is mixed up with other funds, it will be difficult to ensure the circulation and turnover of the real estate capital. For this reason, it is necessary to set up special real estate banks, turning them into the clearing and credit centers of the real estate industry. They should operate independently with independent accounting and strive to balance their capital and to absorb the profit gaps. Their scope of operations include: investing in and developing urban land and houses; taking deposits and granting credits for the building of commodity houses and the circulation fields; taking special deposits for the purchase of houses by individuals and granting long-term, low-interest credits with mortgage; issuing housing bonds; and engaging in real estate trust investment business. In this way, the real estate industry will be greatly promoted and the real estate market as a whole will also be boosted to carry out more transactions. Moreover, the establishment of real estate banks will help the state control, manage, and supervise the development and operations of the real estate industry by monetary means.

5. Speed up the formulation of the real estate rules and regulations and ensure the operations of the real estate industry along a sound path. The rise and development of the real estate industry make it necessary to put the criteria for the real estate economic activities in the form of a law so that the law can become an important means to manage and regulate the real estate economic activities. For this reason, it is necessary to speed up the formulation and improvement of the rules and regulations governing the transactions, prices, rent, and management of the real estate industry to ensure legal transactions. Where conditions permit, some cities may also set up real estate arbitration courts to gradually bring into the legal system the work of mediating and arbitrating disputes or cases in the real estate industry. The previous real estate transactions which were not conducted according to legal procedure should be dealt with according to the merit of each case.

PROVINCIAL

Qinghai 1987 Economic Statistics

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[Text] The Qinghai Provincial Statistical Bureau held a meeting in the afternoon on 3 February to release statistics on 1987. Vice Governor Qu Chengzhi [0702 2110 1807] presided over the meeting and comrades from the bureau reported on the implementation of the national economic and social development plan in the province in 1987.

1. Principal economic indicators registered steady gains.

According to preliminary statistics, gross provincial product reached 4.2 billion yuan (current prices, the same hereafter) in 1987, exceeding the annual plan by 10.5 percent and an increase of 8.8 percent in constant prices compared to 1986. The total social product came to 6.76 billion yuan, up 7.2 percent in constant prices over the previous year. Provincial income stood at 3.2 billion yuan, 111.9 percent of the target, up 8.10 percent in constant prices over the preceding year. The gross value of industrial and agricultural output amounted to 3,663,000,000 yuan in 1980 prices, up 10 percent compared to 1986. On a per capita basis, the gross provincial output and provincial income were 977 yuan and 744 yuan, respectively, both substantial improvements over the year before.

2. Agriculture and animal husbandry reaped a bumper harvest.

Qinghai's total agricultural output value in 1987 reached 1,124,000,000 yuan, 102.2 percent of the target in the plan and an increase of 3.8 percent over 1986. The total grain crop was 1,041,500 tons, up 5.9 percent over the year before, a historic high. The total output of oil-bearing crops stood at 103,800 tons, an increase of 0.2 percent. Turning to animal husbandry, calculations based on sample surveys show that there were 6,025,000 large animals at year end, down 3.03 percent from a year ago. Sheep and pigs numbered 14,265,500 and 87,390 at year end, down 4.55 percent and 0.73 percent, respectively, compared to 1986. Output in major categories of livestock products is expected to meet the plan projections. Forestry production conditions were good. During the year, 686,900 mu were afforested.

3. Industrial production maintained sustained steady growth.

The province's total industrial output value was 2,426,000,000 yuan in 1987, up 13.79 percent over the year before. If the output value of industries run by units at the village level and below and by individuals in urban areas is included, the total industrial output value would be 2,559,000,000 yuan, up 13 percent over the preceding year. Of the total, 2,459,000,000 yuan was the total output value of industries under provincial planning and examination, 104.63 percent of the projected figure and up 14.37 percent over a year ago. Of the 58 categories of major industrial products incorporated in the plan, 30 fulfilled or over-fulfilled their targets while 36 registered output increases over last year.

These were the principal characteristics of industrial production in Qinghai: 1) Steady increase in output value and sales earnings. By late December, the total output value and sales earnings of state-run industrial enterprises in the budget had risen 19.5 percent and 23.0 percent, respectively, over the same period a year before. 2) Energy, major raw materials industries (steel, rolled steel, sulfuric acid, and soda ash), and light and textile industries consistently maintained a growth momentum.

Growth was especially strong in those sectors where Qinghai is well endowed with natural resources, such as hydroelectricity, crude oil, knitting wool, powdered milk, and crude salt. 3) The overall labor productivity in industrial enterprises that practiced independent accounting went up. According to progress statistics, the annual overall labor productivity reached 11,577 yuan per person, up 9.4 percent over 1986. In light industry, the overall labor productivity was 17,567 yuan per person, up 4.2 percent; in heavy industry, it was 9,763 yuan per person, up 10.4 percent.

Nevertheless, industrial production still had a number of problems that could not be ignored. Economic efficiency was on a downward trend, primarily because of rising raw material prices, the increasing share purchased at negotiated prices, and management problems.

The situation in transport and post and telecommunications was quite good. The volume of cargo handled by railways is estimated to be 6.10 million tons in 1987, up 6.5 percent since 1986, and the number of passengers is put at 3.25 million, up 4.17 percent. The corresponding figures for highways are estimated to be 2.30 million tons and 12 million passengers, respectively, basically unchanged from the preceding year. Business transactions in post and telecommunications in the province totalled 20,118,000 yuan, a 7.8 percent increase over 1986.

4. The scale of investment in fixed assets has been brought under preliminary control and key construction projects made good progress.

According to progress statistics, in 1987 units owned by the whole people in the province completed 1,683,000,000 yuan worth of investments in capital construction, equipment replacement, and technical transformation, up 7.47 percent over 1986. Of the total, investment in capital construction amounted to 1,492,000,000 yuan, up 6.9 percent over the previous year, and investment in equipment replacement and transformation accounted for 191 million yuan, up 12.35 percent. Of the total capital construction investments, completed national projects accounted for 1,028,000,000 yuan, up 16.3 percent, and completed local projects, 464 million yuan, down 9.2 percent. Of this total, 74.7 percent, or 1,115,000,000 yuan, went into productive projects, up 16.4 percent over a year ago, and 25.3 percent, or 377 million yuan, went into non-productive projects, down 13.9 percent compared to 1986. Nine major large and medium-sized projects, including Longyangxia hydropower station and Xining airport, completed 997 million yuan worth of investments, or 95.6 percent of planned investments. The Xitieshan lead and zinc mine has been completed and gone into production. At the Longyangxia hydropower station, two generating sets are in operation, as is the 330 electric delivery and transformer facility. Phase 1 of Qinghai Aluminum Plant and Minhuo magnesium plant are largely completed.

5. The urban and rural markets were increasingly prosperous, both foreign and domestic trade thrived, and supply and demand were normal for most commodities.

In 1987, social commodity retail sales hit 2,206,000,000 yuan, 102.6 percent of the target in the plan and up 8.81 percent over 1986. When price increases are factored in, the actual increase was 1.4 percent. Of the total retail sales, the value of daily consumer goods was 2,066,000,000 yuan, an increase of 8.66 percent (or 1.1 percent if price rises are taken into account). The retail sales of farm production materials and equipment reached 140 million yuan, up 11.1 percent (6.7 percent after discounting price increases). Of the total retail sales of daily consumer goods, consumer goods sold to urban and rural residents accounted for 1,864,000,000 yuan, up 9.03 percent (1.4 percent after discounting for inflation), while those sold to social institutions amounted to 202 million yuan, an increase of 5.33 percent over 1986 but still lower than the national increase rate of 19.7 percent. The purchasing power of social groups has been brought under control.

These were the characteristics of the urban and rural retail markets in 1987: 1) Retail sales at the county level and below rose 18.2 percent and 12.4 percent, respectively, both faster than the rise in retail sales in cities, which was 9.0 percent. 2) Retail sales in the collective and individual sectors expanded 16.9 percent and 42.6 percent, respectively, compared to 1986, more rapid than those in the state-owned sector, which increased 2.8 percent. 3) Retail sales in the restaurant business shot up 43.5 percent over 1986.

In 1987, Qinghai purchased a net total of 1,281,000,000 yuan worth of commodities, up 16.5 percent over 1986, and "imported" from other provinces 817 million worth of goods, up 4.68 percent. With the exception of a small number of commodities in short supply, supply and demand were normal for most goods.

Nineteen eighty-seven was a banner year in foreign trade, with exports up 51.8 percent over 1986, at $40.13 million.

6. Conditions in finance and banking were good.

According to progress statistics, local revenues in Qinghai broke through the 400 million yuan barrier for the first time in 1987 to hit 401 million yuan, up 24.9 percent compared to 1986. Total expenditures reached 1.22 billion yuan, down 0.2 percent from 1986. Of the total expenditures, capital construction accounted for 198 million yuan, down 6.7 percent; culture, education, science, and public health, 280 million yuan, up 3.15 percent; price subsidies, 149 million yuan, up 6.5 percent; and administration and management, 168 million yuan, up 6.7 percent.

Bank deposits in the province stood at 3.64 billion yuan at year end, an increase of 21.4 percent over late 1986. Of this amount, enterprise deposits amounted to 1,442,000,000 yuan, up 20.6 percent, and urban and rural savings deposits, 1,343,000,000 yuan, up 25.9 percent. At year end, assorted loans totaled 4,021,000,000 billion yuan, up 35.7 percent over late 1986, including 2,082,000,000 yuan in working fund loans, up 25.5 percent, 1,281,000,000 yuan in fixed assets loans (including 600 million yuan in capital construction loans), up 64.9 percent, and 202 million yuan in agricultural loans, up 14.5 percent. For the first time, the amount of loans exceeded that of deposits.

As for cash receipts and disbursements, Qinghai banks had a good year in 1987, a rare experience in recent years. For the year as a whole, cash receipts totalled 3,551,000,000 yuan, up 19 percent over 1986, while cash disbursements amounted to 3,684,000,000 yuan, up 15.5 percent. The net amount of money put into circulation was 132 million yuan, 73 million less than in 1986 and the smallest amount since 1980.

7. Culture, education, and public health continued to develop.

According to statistics, the province's 7 regular institutions of higher education recruited 13 graduate students and graduated 20 in 1987, with a year-end enrollment of 66. They recruited 1,936 undergraduates and graduated 1,300, with a year-end enrollment of 6,847. The province's 39 secondary technical schools recruited 4,660 students and graduated 4,100, with a year-end enrollment of 12,620. Its 473 regular high schools recruited 56,600 junior high students while graduating 53,100, and recruited 21,600 senior high students while graduating 16,400, with a combined year-end enrollment of 248,500. Twenty-seven agricultural and vocational secondary schools recruited 5,150 students and graduated 2,895, with a year-end enrollment of almost 10,000. Between them, the province's 3,930 elementary schools recruited 85,500 students and graduated 63,300, with a year-end enrollment of 544,000. The proportion of school-age children at school was 82.4 percent and seven counties (including county-level townships and administrative councils) were inspected by the state and certified to have achieved universal elementary education.

Achievements also were made in adult education: 8 adult universities (including a TV university) recruited 890 students in 1987 and graduated 1,308, with a year-end enrollment of 3,511, and 16 adult secondary technical schools recruited 663 students and graduated 437, with a year- end enrollment of 2,284. In addition, over 35,000 people were enrolled in miscellaneous adult elementary and secondary schools or technical training courses.

As of late 1987, there was a total of 1,683 cultural organizations of all types in the province, with a combined staff of almost 6,000. They included 1,287 film organizations employing 2,900 workers; 21 artistic organizations, 1,500 workers; 19 cultural relics institutions, 180 workers; 41 libraries, 400 workers; and 315 mass cultural centers, 780 workers. There were 1,302 public health organizations at year end, 20 more than in late 1986. The number of hospital beds stood at 15,100, an increase of 700 over a year ago. Professional health workers numbered 19,800, 900 more than in 1986.

8. Living Standards

According to sample survey data, annual per-capita net income averaged 392.15 yuan among peasants and herdsmen, up 6.2 percent since 1986. Average annual per capita spending on daily consumer goods was 327.77 yuan, an increase of 2.5 percent in real terms. Among urban residents, the average monthly per capita income for living expenses amounted to 78.91 yuan, up 8.2 percent over 1986, and average monthly per capita living expenses were 69.03 yuan, basically unchanged in real terms from the preceding year.

The province's payroll for workers amounted to 1,262,000,000 yuan in 1987, up 7.96 percent over 1986. The average annual wage for workers was 1,978 yuan. While this represents a 7.6 percent increase over 1986, the actual income essentially remained the same as a year ago after taking into account inflation.

In 1987, 28,400 urban residents were placed in jobs, a drop of 12,200 from 1986. At year end, 43,600 people in urban areas were waiting for employment, 8,200 more than the same period in 1986. Because more people were waiting for jobs and fewer people found jobs, some urban residents shouldered a heavier burden in terms of living expenses.

While the province did very well economically and much headway was made in a variety of social developments in 1987, some problems remained.

One was the unsatisfactory economic performance of industrial enterprises. Of the province's 256 local state-run industrial enterprises in the budget, 63, or 24.6 percent, lost money to the tune of 24.56 million yuan in all, up 49.8 percent over 1986. After offsetting losses with profits, a net profit of 66.49 million yuan was realized, down 12.3 percent from 1986. The cost of comparable products of these enterprises rose 3.6 percent in 1987 compared to 1986, while the proportion of current fund with norm grew 17.4 percent, including a 30 percent increase in finished products fund.

Production in collective industry was in a bad slump, particularly that in Xining, which hit a downturn, as manifested by the declining number of collective industrial enterprises and the drop in total industrial output. In 1987, there were 906 collective industrial enterprises in the province, 33 fewer than in 1986. In Xining, collective industrial enterprises declined 11.20 percent from 366 in 1986 to 325 last year. Total industrial output

value decreased 5.3 percent from 255.19 million yuan in 1986 to 241.73 million yuan. Some enterprises were tottering on the brink of bankruptcy because of serious losses.

Another problem was that the price index had overtaken the control target, resulting in a drop in real living standards for some urban and rural residents. For the province as a whole, the retail price index rose 7.3 percent in 1987 over 1986, exceeding the control target of 6 percent. It went up 8 percent in urban areas and 5.3 percent in the countryside. Residents' cost of living index climbed 7.2 percent; it rose 7.8 percent and 5.2 percent, respectively, in urban areas and the countryside. Continuous price hikes have become too much of a burden to some urban and rural residents.

A third problem was the looming baby boom and a natural population growth rate that was getting out of control. According to estimates based on demographic change sample surveys, Qinghai's birth rate had reached 22.59 per thousand and natural growth rate, 16.17 per thousand. The province's population stood at 42.79 million at the end of 1987.

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Shaanxi 1987 Socioeconomic Statistics

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["Communique on Economic and Social Development Statistics for 1987 issued by the Provincial Statistics Bureau on 24 March 1987"]

[Text] In 1987, under the leadership of the provincial party committee and government, the people in Shaanxi continued to implement the policy of reform, opening up, and economic invigoration; vigorously carried out the drive to increase production and practice economy and increase income and retrench expenditure; made efforts to deepen enterprise reform; implemented the contracted management responsibility system; and achieved remarkable successes. Industrial and agricultural production grew in a sustained and steady manner, urban and rural markets were brisk, tourism and foreign trade were further expanded, and new headway was made in science and technology, culture and education, public health, and sports. According to initial estimates, Shaanxi's gross national product for 1987 was 22.65 billion yuan (Footnote 1) (Gross national product refers to the increased value of both the material productive and nonproductive sectors, and net income from other provinces and abroad, not including the value of products and labor services consumed by intermediate units) and national income amounted to 18.07 billion yuan, an average increase of 9.3 percent respectively over 1987. The major problems in national economic development were that society's total demand outstripped total supply, the shortages of some commodities including principal nonstaple foodstuffs, substantial price hikes, and the rapid growth of population.

I. Agriculture

Despite serious natural disasters, remarkable achievements were attained in agricultural production in 1987. The total output value of agriculture reached 7.34 billion yuan, a 2.7 percent increase over 1986.

The output of all principal farm produce increased. Grain output totaled 9.879 million tons, second only to the high recorded in 1984 and an increase of 224,000 tons over 1986. Of this total, summer grain dropped by 277,000 tons, while autumn grain increased by 501,000 tons, the drop in summer grain being offset by the increase in autumn grain. The 4-year decline in cotton production was brought to an end. The total output of oil-bearing crops, tea, silkworm cocoons, cured tobacco, and fruit hit an all-time high.

The output of principal farm produce was as follows:

	1987	Percentage change from 1986
Grain	9,879,000 tons	2.3
Cotton	56,000 tons	34.9
Oil-bearing crops	315,000 tons	4.6
of which: rapeseed	198,000 tons	9.7
Cured tobacco	50,000 tons	20.2
Silkworm cocoons	(?7,000 tons)	13.5
Tea	4,000 tons	17.6
Fruit	488,000 tons	29.3

Thanks to the implementation of the "Forestry Law" and to efforts made to strengthen management over forests, the quality of afforestation improved somewhat. However, there was indiscriminate felling of trees in some localities and fire protection work in foresry was a weak link.

In animal husbandry, large animals increased for 5 successive years. The number of sheep and goats also rose, with numbers of milk goats reaching a new high. The output of milk, beef, mutton, poultry, and eggs increased. However, the number of pigs slaughtered and in stock and the output of pork and wool decreased in varying degrees.

The output of principal animal-by products and number of animals were as follows:

	1987	Percentage change from 1986
Pork	291,000 tons	-2.1
Beef and mutton	27,000 tons	29.8
Cows milk	91,000 tons	30.0
Goats milk	124,000 tons	20.4
Wool	3,000 tons	-1.4
Pigs slaughtered	4,341,000 head	-3.5

	1987	Percentage change from 1986
Large animals at year end	2,836,000 head	5.0
Pigs at year-end	6,918,000 head	-11.1
Sheep and goats at year-end	4,635,000 head	17.0
of which: milk goats	745,000 head	15.2

Fishery maintained its high development rate. The output of aquatic products was 12,000 tons, a 33.4 percent increase over 1986.

Investment in agricultural production increased and the construction of farmland irrigation projects was strengthened, resulting in improved conditions for production. In 1987 the aggregate power used by the province's farm machinery reached 6.23 billion watts, a 7.2 percent increase over the preceding year. There were 20,000 large and medium-sized tractors, the same as the previous year; 194,000 small tractors, up 13.5 percent; and 13,000 trucks, up 12.8 percent. The total consumption of electricity in rural areas was 2.18 billion kilowatt-hours, up 15.3 percent from 1986. But the problem of insufficient resources for further agricultural development remained and the output of major farm produce still failed to meet the needs of the national economic development.

Reforms in the rural areas continued to deepen and the production setup was further readjusted. The total social output value in rural areas (Footnote 2) (This includes the total output value of agriculture and of collectively and privately owned rural industries, construction, and transport and commerce) in 1987 was 18.5 billion yuan, an increase of 13.7 percent over the previous year. The proportion of rural industries, construction, and transport and commerce rose from 42.2 percent in 1986 to 44.1 percent.

II. Industry

Industrial production increased steadily. The total output value of industry in 1987 was 24.07 billion yuan, a 14.2 percent increase over the previous year (the figure was 20.65 billion yuan after deducting the output of rural industry, an increase of 12.8 percent). Of this total, the output value of state-owned industry increased by 12.4 percent, collectively owned industry went up 14.5 percent, and individually run industry rose 46.8 percent. If calculated in terms of industries, the output value of light industry was 10.18 billion yuan, a 10.1 percent increase and that of heavy industry, 13.89 billion yuan, an increase of 17.3 percent (if calculated in terms of commodities, light industry increased by 13.5 percent, while heavy industry rose 14.7 percent). Light and heavy industries developed in proportion.

In industrial production in 1987, initial results were achieved in readjusting the production setup and product mix. Agricultural support industries increased remarkably; ordnance enterprises made marked progress in developing products for civilian use; electronics, energy, nonferrous metal, and chemical industries developed rapidly; machine-building and iron and steel industries developed steadily; the output of marketable textile and light industrial products increased by a big margin; and exports of manufactured goods hit an all-time high. However, the tasks of readjusting the industrial production setup and product mix were still arduous and the demand for raw materials, energy, capital, and transport facilities outstripped supply.

The output of principal industrial products was as follows:

	1987	Percentage Change from 1986
Cotton yarn	173,000 tons	5.4
Cloth	740 million meters	3.9
Knitting wool	2,906 tons	3.9
Woollen fabrics	5.48 million meters	33.3
Machine-made paper and paper board	270,000 tons	18.2
Chemical pharmaceuticals	5,695 tons	10.3
Detergent	21,000 tons	2.5
Bicycles	256,000	58.3
Sewing machines	705,000	5.7
Wrist watches	1.43 million	-8.5
Television sets	675,000	33.2
of which: color sets	385,000	61.2
Household washing machines	250,000	-4.0
Household refrigerators	24,000	107 fold
Milk products	17,000 tons	41.7
Cigarettes	904,000 cases	24.9
Beer	148,000 tons	15.3
Coal	28.56 million tons	0.0
Crude oil	357,000 tons	34.3
Electricity	14.37 billion kwh	14.8
including: hydroelectricity	0.91 billion kwh	27.1
Pig iron	343,000 tons	31.4
Steel	397,000 tons	9.7
Rolled steel	266,000 tons	14.5
Cement	4.693 million tons	5.6
Plate glass	661,000 cases	12.7
Timber	660,000 cubic meters	4.9
Sulphuric acid	210,000 tons	(?5.2)
Caustic soda	41,000 tons	5.4
Soda ash	9,884 tons	77.7
Chemical fertilizers	361,000 tons	28.5
Machine tools	2,781	1.5
of which: high precision tools	128	-21.9

	1987	Percentage Change from 1986
Motor vehicles	855	19.3
Small tractors	23,000	48.0
Internal-combustion engines	352,000 kw	91.1
Color kinescope	1.188 million	6.0

New headway was made in deepening the reform of industrial enterprises. Of the province's state-owned industrial enterprises, 72.6 percent are implementing the system of factory director (manager) assuming sole responsibility and 59 percent are implementing various forms of the contracted management responsibility system. Of the enterprises implementing the contracted management responsibility system, those involved in contract or leasing accounted for 19.1 percent, those contracting for the profits or losses accounted for 17.1 percent, those contracting for profits delivery and retaining extra profits and those contracting for the progressive increase in profits delivery respectively accounted for 22.9 percent, and those practicing other forms accounted for 18 percent.

Better economic results were achieved in industry thanks to the deepening of reform. Income from sales of the province's industrial enterprises practicing independent accounting in 1987 totaled 21.04 billion yuan, an increase of 18.3 percent over the previous year; profits and taxes reached 3.23 billion yuan, up 7 percent; and profits delivered amounted to 2.5 billion yuan, up 9 percent. Of this sum, income from sales of the local budgeted state-owned industrial enterprises totaled 9.32 billion yuan, a 16.4 percent increase; profits and taxes reached 1.49 billion yuan, up 9.2 percent; and profits delivered amounted to 0.97 billion yuan, up 9 percent, an increase which corresponded to output value. The amount of deficits incurred by losing enterprises dropped by 19.2 percent. Per capita productivity for state-owned industrial enterprises was 13,116 yuan, up 9.3 percent from 1986. The quality of principal products improved, while energy consumption fell. Because of external environmental changes and poor adaptability of some enterprises, however, both the amount of working capital and costs increased. This required introduction of the competition mechanism and further upgrading of the management level.

Horizontal economic associations developed in depth. In the year the number of horizontally associated organizations made up chiefly of industrial enterprises above the county level reached 177, a 20.4 percent increase over 1986. This sum included 73 associations transcending provinces (municipalities and autonomous regions).

III. Investment in Fixed Assets and the Building Industry

In 1987 investment made by the state-owned units in fixed assets totaled 5.81 billion yuan, a 23 percent increase or 1.09 billion yuan more than in the previous year.

With the implementation of the policy of "supporting key or productive projects and planned investment while curbing nonproductive or unimportant projects and extra-plan investment" in capital construction, the investment structure was further readjusted. Investment made by the state-owned units in capital construction totaled 3.44 billion yuan, an increase of 18.2 percent over 1986, the proportion of investment in productive projects which rose from 53.7 percent in 1986 to 58.8 percent and the proportion of investment in nonproductive projects dropped from 46.3 percent in 1986 to 41.2 percent. The transportation and communications departments invested 370 million yuan in capital construction, the proportion of which increased from 8.4 percent in 1986 to 10.7 percent; the light industrial departments invested 330 million yuan, the proportion of which increased from 5.6 percent to 9.7 percent; and investment made by agricultural and forestry departments in water conservancy projects increased somewhat, putting an end to the long-standing downward tendency. However, investment made by the energy and raw and semifinished materials industrial departments dropped from 18.2 percent and 11.4 percent respectively in 1986 to 16 percent and 8.9 percent.

Technological transformation of enterprises advanced steadily. In 1987 the province's state-owned units invested 2.07 billion yuan in updating equipment, a 26.5 percent increase over the previous year. Of this, investment made by the electronics, metallurgical, nonferrous metal, petroleum, machine-building, building materials, textile, light industrial, and tobacco departments outstripped their investment in capital construction in the same year. Of the total amount, 750 million yuan was invested in enlarging production capacity, an increase of 45 percent; 430 million yuan in increasing the variety of products, up 24.1 percent; 110 million yuan in improving product quality, up 37.9 percent; 40 million yuan in reducing energy consumption, up 23.9 percent; and 30 million yuan in dealing with waste material, up 53.6 percent. Of the investment in purchasing equipment, tools, and appliances, one-third was used in updating the outmoded equipment.

Construction of key projects was ensured. A total of 1,171 capital construction projects were completed and put into operation. The equipment of 1,045 projects was updated. Six key projects completed included: The project to enlarge the Xian Pharmaceutical Factory, the refrigerator production line of the Changling Machine Plant, the counterblow hammer project at the Hongyuan Foundry, the cotton-silk interweaving production line of the Xibei No 4 Cotton Mill, the Provincial Radio and TV Transmission Tower, and the Xian Satellite Monitoring Center. The 10 key projects basically completed included: the Shaanxi Glass Factory, the sulphuric acid project of the Shaanxi Compound Fertilizer Plant, the Xian Iron and Steel Plant, the project to enlarge the Baoji Petroleum Steel Tube Plant, the Provincial Tumor Prevention and Cure Research Institute, and the second phase project of Xian Guesthouse.

Better returns were yielded from investment. In 1987 the newly added fixed assets of state-owned units totaled 4.01 billion yuan, a 23.5 percent increase over the preceding year, the rate of availability which reached 69.1 percent. Of this, the newly added fixed assets totaled 2.35 billion yuan in capital construction and 1.45 billion yuan in updating equipment. The period of capital construction was shortened from 6.3 years in 1986 to 5.7 years and investment yielded better returns. Newly added production capacities in state-owned units include: 80,000 tons of steel, 9,255 tons of aluminium electrolysis, 750,000 tons of coal, 232,000 tons of crude oil, 15,000 tons of sulphuric acid, 2,000 tons of caustic soda, 18,000 tons of synthetic ammonia, 12,000 tons of chemical fertilizers, 300 trucks, 439,000 tons of cement, 34,000 cotton spindles, 1,380 woollen spindles, 69,000 tons of liquor, 17,000 tons of machine-made paper and paper board, 100,000 refrigerators, 107,000 mu of effective irrigated area, commercial and catering centers occupying an area of 128,000 square meters, 87,000 places for students of various kinds of schools, and 4,649 hospital beds.

Reforms in the building industry deepened. Last year 64 state-owned construction enterprises implemented the contracted management responsibility system and contracted 4,124 projects, which covered a construction area of 4.477 million square meters. The projects accounted for 75.8 percent of the province's total and the construction area accounted for 83.7 percent. The construction enterprises implemented the system for contracting salary used for the output value of every 100 yuan. Reform promoted the development of their business. In 1987 the total output value of the state-owned building industry amounted to 1.75 billion yuan, a 9.4 percent increase over the previous year. This total included 890 million yuan from local building industry, up 11.3 percent. Per capita labor productivity increased by 12 percent and the quality of projects improved. The number of projects undertaken and the fine quality of construction reached 73.4 percent and 50.1 percent, an increase of 1.7 percent and 0.5 percent, respectively over 1986. Profits made by construction enterprises dropped 46.4 percent.

Geological surveys made marked progress. A total of 33 mineral bases were discovered last year. Reserves of 9.82 billion tons of coal were verified as were 11 kinds of minerals including gold, lead, zinc, and pottery clay, contributing to exploitation of Shaanxi's resources. A total of 162,000 meters of tunneling was completed in 1987.

IV. Transport, Posts and Telecommunications

The transportation departments deepened enterprise reform and continued to tap transport potentials. They overfulfilled the main 1987 production targets. The volume of passengers and cargo handled by various transport means increased in an all-round way.

	1987 (billion)	Percentage change from 1986
Cargo	30.04 ton/km	14.1
Railway	29.16 ton/km	14.4
Highway	0.83 ton/km	5.3
Waterway	0.02 ton/km	1.3
Air	0.03 ton/km	44.9
Passengers	17.15 person/km	12.6
Railway	10.97 person/km	10.0
Highway	4.78 person/km	12.7
Waterway	0.008 person/km	3.2
Air	1.4 person/km	37.1

Posts and telecommunications developed considerably. Business transacted by these departments totaled 95.19 million yuan, 105.9 percent of the annual plan or an increase of 18.9 percent over 1986. The number of letters handled went up 10.5 percent, parcels increased 9.4 percent, telegrams rose 11.5 percent, and long-distance telephone calls were up 15.4 percent. The year-end number of telephone subscribers in urban areas was 68,000, a 12.2 percent increase over 1986.

By implementing various forms of the contracted management responsibility system, the transportation departments attained better economic results, reduced material consumption, and made more profits.

V. Urban and Rural Markets and Supply and Marketing of Materials

Urban and rural markets remained brisk in 1987. The value of retail sales totaled 12.1 billion yuan, a 16.2 percent increase from 1986. Of the total retail sales, the value of consumer goods was 10.62 billion yuan, an increase of 16.1 percent, and of agricultural means of production 1.48 billion yuan, up 16.7 percent. The value of retail consumables bought by social groups reached 1.6 billion yuan, a 19.7 percent increase over 1986.

Commerce of various economic sectors developed and retail sales of all commodities has increased since 1986. Retail sales in the state-owned sector grew by 14.5 percent; in the collectively owned sector, by 14.9 percent; in the joint public and private-owned sector, by 1.6 percent; and in the individual sector, by 27.6 percent. An 18.2 percent rise was registered in transactions between farmers and nonagricultural people.

Consumer goods supply increased steadily. Food increased by 18 percent, garments went up 10.1 percent, and other necessities were up 17.9 percent. Apart from pork, sugar, vegetables, and some other foods which were in somewhat short supply, food supplies were sufficient.

Structural reforms in commerce progressed. By the end of 1987, over 50 percent of the large and medium state-owned commercial enterprises had implemented the contracted management responsibility system; and 90 percent of the small state-owned commercial enterprises were handed over to collectives and collective

ownership, or leased to individuals. Over 90 percent of the supply and marketing cooperatives perfected the internal management responsibility system and over 40 percent of the enteyprises implemented the target management responsibility system for leading cadres during their term of office. Enterprises were further invigorated and the markets were competitive. The number of urban and rural fairs in 1987 totaled 2,052, an increase of 3 percent over the previous year. Their business volume in 1987 amounted to 2.49 billion yuan, a 27.7 percent rise over the preceding year. Commercial associations spread continuously, numbering 91 by the end of 1987, a 30 percent rise over 1986. In 1987 they made a profit of 5.94 million on a turnover of 110 million yuan.

The market for capital goods continued to grow. As the proportion of materials distributed under state plan dropped, the proportion of materials purchased by Shaanxi rose. In 1987 the volume of materials purchased by the province's material departments totaled 1.28 billion yuan, a 48.5 percent increase over the preceding year. Of this, rolled steel rose 29.6 percent; timber, up 3.5 percent; cement, up 2.7 percent; and electrical and mechanical equipment, up 65.3 percent. Thanks to the expansion of the market for capital goods, sale centers increased from 964 in 1.86 to 1,066. Their sales volume totaled 2.72 billion yuan, a growth of 24.2 percent. Of this, sales volume of the trading centers totaled 480 million yuan, an increase of 120 percent. Capital goods supplied by the material departments to rural areas increased somewhat, with sales volume reaching 200 million yuan, a 7.5 percent increase. Of this, rolled steel increased by 50.8 percent and electrical and mechanical equipment by 54.7 percent.

Retail prices rose considerably. The retail price index rose by 8.6 percent over the previous year. The retail price index rose 9.7 percent in urban areas and 7.1 percent in rural areas. The price of foodstuffs went up by 11.5 percent (meat, poultry, and eggs, up 22.9 percent; fresh vegetables, up 17.8 percent; and aquatic products, up 10.4 percent). The cost of clothes rose by 5.4 percent; daily necessities, up 6.7 percent; medicine and medical apparatus, up 3.8 percent; fuel, up 4.1 percent; and capital goods for farming, up 8.3 percent.

According to a sample survey of 19 cities and counties, in 1987 the cost of living index for employees went up by an average of 9.2 34:3,5; and over 10 percent in Xian, Baoji, Hanzhong, and Yulin; by 7 to 10 percent in Xianyang, Tongchuan, Weinan, Yanan, and Ankang; and by 5.9 percent in Shangxian.

The purchase price of farm produce rose by 10.8 percent.

The main problems in managing the market and prices were: Monopolized trades or enterprises arbitrarily raising the buying and selling prices of some scarce goods, and profiting a great deal by acting as business go-betweens. A number of stores and pedlars raised prices in disguise by offering second-rate goods as first-rate ones, or giving customers fewer goods than they paid for. All this increased the burden of customers.

VI. Foreign Trade and Tourism

Foreign trade flourished and foreign exchange earned through exports increased by a big margin. In 1987 the province's imports and exports totaled $347 million, a 47.7 percent increase over the preceding year. Of this, exports amounted to $266 million, up 54.7 percent, while imports totaled $81 million, up 28.6 percent.

Further advances were made in economic and technological cooperation with foreign countries and more foreign capital was used. In 1987 the province made use of $102 million of foreign capital, an increase of 54.9 percent over 1986. This included $29.1 million of foreign loans, up 1.7 percent; and $72.78 million invested directly by foreign businessmen, up 95.8 percent.

The tourist industry developed considerably and in 1987 Shaanxi attracted 301,000 tourists and visitors from some 100 countries and regions, 16.9 percent more than in 1986. Foreign exchanged earned through tourism during the year amounted to 167 million yuan, up 37.7 percent over 1986.

VII. Science, Technology, Education, and Culture

The ranks of scientists and technicians continued to expand. In 1987 a total of [figure indistinct] natural scientists and technicians were employed in state units, 9,687 more than in 1986. By the end of last year, Shaanxi had 384 independent, state-owned research and development institutes above county level, with a total work force of 67,000.

Shaanxi's scientific and technological achievements produced remarkable economic results. In 1987 a total of 12 inventions, 35 technical advances, and 18 inventive exhibits won state prizes, and another 112 scientific and technical advances won provincial prizes. A total of 444 scientific and technological achievements were registered, of which 10 were international innovations, 18 reached advanced world levels, 35 were domestic inventions, and 150 reached advanced domestic level. These scientific and technological achievements produced remarkable economic results. The "spark program" which is meant to boost economic development in the rural areas manifested its great vitality. Most of the projects involved were planned and implemented, and produced the desired results in the same year. In 1987 the 29 "spark program" projects turned out 340 million yuan of economic results. The technological market blossomed and a total of 4,700 contracts were signed worth 150 million yuan.

Patent work developed rapidly last year. The provincial patent office received 704 applications for patent rights, a 64 percent increase over 1986. A total of 185 patents were granted with the approval of the State Patent Bureau, up 130 percent.

Meteorological departments made fairly prompt and accurate weather forecasts, providing a great deal of socially and economically helpful data.

To boost economic construction and access to resources, the cartographic departments drew up 3,186 maps. Altogether 42 maps were printed, with a total impression of 3,763.

Education developed in the course of reform. Institutions of higher learning enrolled 2,351 postgraduates in 1987. There were 7,279 postgraduates studying, 1,677 of whom received postgraduate degrees. Universities and colleges enrolled 28,000 students last year and the total student body was 92,000, up 3.2 percent from 1986. Last year 26,000 students of higher education graduated. Institutions of adult higher education registered 17,000 students in 1987, making a total enrollment of 58,000.

The structure of secondary education was further rationalized. The various vocational and technical schools had an enrollment of 144,000 students, 12,000 more than in 1986. This represented 44 percent of the total number of students in senior middle schools. In 1987 there were 31,000 students studying at adult vocational schools and 245,000 at adult technical schools.

Elementary education was further strengthened and the pace of popularizing elementary education was accelerated. In 1987 there were 1.47 million pupils in junior middle schools and 3.394 million pupils in primary schools. The attendance rate of school-aged children rose from 97.7 percent in 1986 to 98 percent. Some 99 counties were recognized as popularizing elementary education, with the rate reaching 92.5 percent. Much headway was made in special education for the physically disabled and mentally retarded.

The province's culture, press, radio, film, television, and publications flourished. In 1987 Shaanxi produced 11 feature films and 22 television series. "Old Well" and "Red Sorghum" each won awards at international film festivals, enjoying a reputation at home and abroad. A total of 202 feature films and documentaries were released last year. The province boasts 5,147 cinemas and film projection teams, 134 performing art troupes, 113 cultural centers, 113 public libraries, and 44 museums. The discovery of Famen Monastery and the first art festival sponsored by Shaanxi promoted the province's flourishing arts. In 1987 there were 4 broadcasting stations and 11 radio transmitting and relay stations, the rate of coverage which reached 56.8 percent. In addition, there were 5 television stations, 14 television transmitting and relay stations each with a capacity of more than 1,000 watts, and 142 ground satellite receiving stations, whose rate of coverage reached 56.6 percent. Some 470 million copies of 50 kinds of provincial, prefectural, and county newspapers, 29.36 million copies of 186 kinds of magazines and periodicals, and 72.78 million copies of 1,437 books were published last year.

VIII. Public Health and Sports

Medicine and public health services improved. The province had 70,000 hospital beds at the end of 1987, a 3.7 percent increase over the previous year. Professional health workers numbered 112,000, up 3 percent from 1986. The total included 53,000 doctors, up 3.3 percent; and 21,000 nurses, up 5.8 percent. New successes were achieved in preventing and controlling various infectious and chronic diseases.

Athletes gave full play to their remarkable abilities. In 1987 Shaanxi's athletes won 51 gold, 28 silver, and 28 bronze medals in the major games held at home and abroad. The men's basketball and football teams were among the 8 strongest teams in the country and the women's football team was one of the 4 strongest national teams. The province's athletes broke 1 world record, 3 Asian records, 3 national records, and 1 national youth record. They achieved record results at the Sixth National Games, winning honor for the people of the whole province.

IX. Living Standards

The number of people employed increased last year. In 1987 jobs were offered to 120,000 people in urban areas. The province had 3.58 million staff members and workers at the end of 1987, an increase of 80,000 over the previous year. This included 240,000 staff members and workers employed by state-owned units on a contract basis, an increase of 70,000; and 140,000 individual businessmen, 40,000 more than in 1986.

People's income in both cities and countryside continued to increase. In 1987 the province's gross payroll totaled 4.8 billion yuan, an increase of 500 million yuan or 12.2 percent over 1986. A sample survey of urban employees' families showed an average per capita income of 838 yuan for living expenses, a 10.9 percent rise from 1986. If price hikes are taken into account real per capita income rose 1.5 percent. A sample survey of peasants' families indicated an average per capita net income of 329.5 yuan, 10.2 percent more than in 1986, but income increased 6.2 percent in real terms. Savings deposits increased greatly. By the end of 1987, individuals' bank savings amounted to 8.83 billion yuan, 2.59 billion yuan or 41.4 percent more than the 1986 year-end figure. The income rise for urban employees of different status was not balanced and the real income of 21 percent of the urban families dropped because of price hikes. In the rural areas, the average annual per capita net income of 19 percent of the peasants' families was below 200 yuan.

Housing for both urban and rural dwellers improved. In 1987 a total of 3.953 million square meters of housing floor space were built in urban areas and 19 million square meters in the countryside.

Social welfare services improved somewhat. In 1987 the province had 1,208 social welfare establishments, providing for over 10,00 people. Urban and rural collectives provided for 43,000 elderly, disabled, and orphans. Families who were suffering great hardships were given relief and support. Work and study opportunities and conditions for the disabled improved. Great progress was made in supporting the poverty-stricken areas in southern and northern Shaanxi.

X. Population

According to a sample survey of 1 percent of the population and calculations made in the latter half of the year, the province's birth rate in 1987 was 21.6 per thousand, the mortality rate was 6.3 per thousand, yielding a natural growth rate of 15.3 per thousand. By the end of 1987, the province had 30.89 million people.

Note: All figures involving gross national product and national income given in this communique are preliminary statistics and are calculated in terms of 1987 prices. The total output value of industry and agriculture listed here is calculated in terms of 1980 prices, and the rates of growth are calculated according to comparable prices.

Tianjin Economic Development Statistics

SK1905011688 Tianjin TIANJIN RIBAO in Chinese 4 May 88 p 3

[Statistical communique on Tianjin's 1987 social and economic development, issued by the Tianjin Municipal Statistical Bureau—date not given]

[Text] In 1987, under the leadership of the Tianjin Municipal CPC Committee and the Municipal People's Government, the people throughout the municipality adhered to the principles of reform and opening up to the outside world, deepened enterprise reform, popularized various forms of contracted managerial responsibility system, and launched a movement to increase production and income and practice economy. As a result, the national economy developed steadily; industrial and agricultural production showed a sustained increase; the domestic market remained brisk; economic exchanges with other countries expanded; and new achievements were made in science, technology, culture, education, and public health. According to initial estimates, the annual GNP reached 21.6 billion yuan, an increase of 8.7 percent over 1986. The primary, secondary, and tertiary industries developed in a balanced manner. Primary industry scored a 9.9-percent increase; secondayy industry, 8.5 percent; and tertiary industry, 8.8 percent. The national income came to 18.4 billion yuan, an increase of 8.7 percent over 1986; and the total industrial and agricultural output value came to 38.974 billion yuan, an increase of 11.8 percent. Living standards and the environment of the urban and rural people continued to improve. The major problems in the economy were the prominent structural contradictions between the social supply and the social demand and the relatively poor efficiency in the national economy.

1. Industry

Industrial production developed steadily. The 1987 total industrial output value amounted to 37.227 billion yuan, an increase of 11.8 percent over 1986. (Excluding the output value of village-run industries, this amounts to 32.586 billion yuan, an increase of 8.5 percent over 1986, or more than the planned increase rate of 6 percent.) Of this figure, the output value of the state-owned sector rose by 6.6 percent; that of the collective sector, by 23.6 percent; that of the collectively owned town and township enterprises, by 45.0 percent; that of Sino-foreign joint ventures and cooperative enterprises, by 32.0 percent; and that of the private sector, by 15.5 percent.

Heavy industry developed more rapidly than light industry. The 1987 output value in light industry reached 20.098 billion yuan, an increase of 10.1 percent over 1986; and in heavy industry, it reached 17.129 billion yuan, an increase of 14.0 percent.

The product structure was readjusted. In 1987 the output value of the 200 varieties of products which are in short supply and which are administered by the municipal authorities reached 12.1 billion yuan, an increase of 21 percent over 1986, greatly surpassing the average growth rate of the municipal industrial production. Output of some energy products, raw materials, products for aiding agriculture, and readily marketable light and textile industrial products increased substantially.

The output of major industrial products was as follows:

	1987	Increase Over 1986 (percent)
Electricity	8.109 billion kilowatt-hours	3.5
Crude oil	4,530,100 tons	9.6
Natural gas	433.35 million cubic meters	-8.4
Steel	1,629,600 tons	8.4
Pig iron	1,015,400 tons	11.3
Rolled steel	1,750,200 tons	8.0
Cement	1,201,900 tons	6.9
Soda ash	541,000 tons	2.9
Caustic soda	247,300 tons	3.2
Chemical fertilizer (100 percent effective composition)	65,600 tons	60.4
Plastics	112,100 tons	4.8
Salt	1,541,800 tons	-17.6
Plate glass	1,160,100 heavy boxes	19.7

	1987	Increase Over 1986 (percent)
Paper and paperboard	279,200 tons	5.6
Tires	479,900	21.1
Machine tool	s 2,034	-24.6
Motor vehicl	es 30,166	40.4
Cigarettes	500,400 crates	3.2
Beer	75,400 tons	21.8
Chemical fiber	66,100 tons	0.6
Cotton yarn	125,700 tons	2.9
Cloth	439 million meters	-0.2
Woolen fabrics	16.4 million meters	5.8
Garment	131.45 million pieces	22.6
Leather shoe	s 26.78 million pairs	80.5
Bicycles	6,405,400	8.5
Wrist watches	5,014,200	0.9
Television	sets 1,000,200	11.3
of which		
color sets	554,600	65.4
Tape recorders	228,200	-21.8
Cameras	300,000	76.5
Washing machines for household use	154,000	54.2
Refrigerators for household use	145,300	48.4

New progress was made in the development of new products. A total of 2,645 new products were trial-manufactured in 1987, an increase of 22.7 percent over 1986; and 1,647 newly trial-manufactured products were put into production, an increase of 20.2 percent. The production rate of newly trial-manufactured products was 62.3 percent, a drop of 1.4 percent from the 1986 figure of 63.7 percent.

The economic results of industrial enterprises improved. The total output value of local budgetary industrial enterprises reached 19.378 billion yuan in 1987, an increase of 7.0 percent over the 1986 figure. The income from sales of products was 20.85 billion yuan, an increase of 13.3 percent. The profits and taxes realized by these enterprises reached 4.04 billion yuan, an increase of 5.4 percent. The turnover period of the working funds was shortened from 92.4 days to 91.8 days. Productivity rose from 24,280 yuan per capita in 1986 to 25,701 yuan per capita, an increase of 5.9 percent. The output value, sales income, and profits and taxes realized by 105 key industrial enterprises that had played an exemplary role in carrying out the contract system from the beginning of 1987 increased by 10.1 percent, 17.7 percent, and 11.6 percent, respectively. The quality of most products improved steadily. Of the 98 major products whose quality is covered in the municipal quality management targets, the quality of 19 products improved and that of 76 products was stable, accounting for 96.9 percent. Five products won international gold prizes, and 11 products won state quality prizes. The material consumption of most products dropped steadily and the per-unit material consumption of major products was steadily dropped by 86.6 percent, 1.5 percent more than the 1986 figure. Because of factors such as the poor results in using fixed funds and raw material price hikes, the capital utilization ratio dropped from 32.33 percent in 1986 to 30.33 percent, the cost of comparable products rose by 8.0 percent, and the volume of enterprise deficits rose by 28.2 percent.

Industrial enterprises made new progress in reforming their inherent mechanism. Of all state industrial enterprises throughout the province, 61.9 percent carried out the plant director responsibility system, 72.3 percent of the large and medium-sized enterprises carried out various forms of the contract management responsibility system, and 37.3 percent of the small enterprises were either given over to collective management or leased or contracted to individuals. Lateral economic cooperation was further expanded. By the end of 1987, some 288 industrial enterprises joined the cooperation. Of this, 161, or 55.9 percent, were closely integrated with each other. The total investment was 517 million yuan. The total industrial output value and the total profits realized by these enterprises increased by 14.0 percent and 24.9 percent, respectively.

2. Rural Economy

Rural reform deepened continuously and the rural economy was developed comprehensively. The total output value realized by the rural areas reached 11.854 billion yuan in 1987, an increase of 37.2 percent. Of this, the output value realized by rural industries, the building industry, the transportation trade, and commerce (including the catering trade) reached 8.561 billion yuan, an increase of 44.1 percent. The proportion of the output value realized by these industries and trades in the total rural output value rose from 68.8 percent in 1986 to 72.2 percent. The transfer of agricultural labor forces to non-agricultural ones was accelerated. The proportion of non-agricultural labor forces in the total rural labor forces rose from 48.0 percent in 1986 to 49.0 percent.

Agricultural production increased constantly. The total agricultural output value (not including the output value realized by the industries at or below the village level) reached 1.747 billion yuan in 1987, an increase of 11.7 percent over 1986. The grain and vegetable growing areas basically remained at 1986 levels. Under the situation in which comparatively many natural disasters took place in 1987, the grain and vegetable production reached a new peak. Total grain output reached 1.677 million tons, an increase of 10.1 percent over 1986; and total vegetable output reached 2.025 million tons, an increase of 8.9 percent over 1986. The yield of grain reached 244 kg per mu and that of vegetables was 3,031 kg per mu, showing an increase of 6.1 percent and 3.8 percent, respectively. The municipality reaped a bumper

fruit harvest. The total of fruit output increased by 37 percent. The output of cotton and oil-bearing crops was reduced from 1986 because of the decrease in sowing areas.

In animal husbandry, the number of large animals increased by 4.2 percent. The output of milk, poultry, and eggs all increased. However, the number of live pigs and the output of pork dropped.

New headway was made in the fishery field. The per-capita amount of aquatic products rose. In 1987 the total output of aquatic products reached 81,000 tons, an increase of 14,000 tons, or 20.9 percent, over 1986. Of this, the total output of marine products was 33,000 tons, a 4.3-percent increase; and that of freshwater products was 48,000 tons, a 35.4-percent increase. The amount of fish rose from 4.46 kg per capita 3 years ago to 8.63 kg per capita.

The output of major agricultural and sideline products was as follows:

	1987	Increase Over 1986 (percent)
Grain	1.677 million tons	6.4
Vegetable	2.025 million tons	4.4
Fruit	92,000 tons	37.0
Cotton	13,000 tons	-3.9
Oil-bearing crops	52,000 tons	-11.0
Meat	74,000 tons	-1.3
Of which: Pork	57,000 tons	-6.7
Milk	53,000 tons	12.6
Poultry and eggs	112,000 tons	5.1
Aquatic products	81,000 tons	20.9
Pigs, at year's end	505,000	-34.2
Pigs slaughtered	797,000	-2.7

Conditions for agricultural production continued to improve. By the end of 1987, the aggregate power used by the municipality's farm machinery reached 3.83 billion watts, an increase of 6.1 percent over 1986. There were 12,500 large and medium-sized tractors, a drop of 2.6 percent; 18,700 small tractors, a 28.2-percent increase; 91,000 irrigation and drainage machines, a 7.1-percent increase; and 14,000 trucks for agricultural use, a 7.6-percent increase. The amount of chemical fertilizers applied reached 273,000 tons (calculated in terms of the amount of material object), a decline of 0.7 percent. The total consumption of electricity in rural areas was 1.16 billion kilowatt-hours, a 2.7-percent increase over 1986. But the problem of inadequate resources for further agricultural development remained, and the task of developing foreign exchange-earning agriculture remained very arduous.

3. Transport, Post, and Telecommunications

The volume of passengers and cargo handled saw steady progress. In 1987 the turnover of goods fulfilled by all transportation means of transportation departments in the municipality came to 91.328 billion ton-kilometers, an increase of 4.7 percent over 1986; of which, the turnover fulfilled by railways increased by 9.2 percent and that by airplanes increased by 130 percent, both being a record high. The turnover fulfilled by ships increased by 3.8 percent and that by highways increased by 3.1 percent. Some 199 million tons of cargo was handled by various transportation means in the municipality, a 1.9-percent increase over 1986. The volume of passenger transportation by various transportation means was 30.373 million persons, a 1.5-percent increase. Of this, 21.11 million were carried by railways, a 1.1-percent increase; and 7.401 million were carried by highways, 5-percent decrease.

Postal and telecommunications services developed greatly, and the urban telecommunications functions improved remarkably. Business transacted by postal and telecommunications departments totaled 72.44 million yuan in 1987, an increase of 17.6 percent over 1986. Of this, the number of letters handled went up by 12.2 percent, and the number of long-distance telephone calls increased by 20.7 percent. In 1987 the municipality installed an additional 10,591 telephone lines, opened 7 program-controlled telephone exchanges, and increased the installed telephone capacity by 22,000 lines, which brought the municipality's total telephone capacity to 110,000 lines. Of this, the number of digital program-controlled telephones with an advanced international level reached 51,500 lines, accounting for 46.8 percent of the total. By the end of 1987, there were 76,200 inter-city telephone subscribers, a 16.1-percent increase over the end of 1986. In 1987 the municipality installed 6 new telegram circuits, 332 long-distance telephone lines, and 540 telephone switchboards. The municipality opened international direct dialing service with more than 40 countries and regions, thus relieving the tension on telephone service to some extent.

The handling capacity of harbors declined somewhat. In 1987 Tianjin Harbor handled 17.21 million tons of goods, a drop of 5.3 percent from 1986. Of this, the volume of imports dropped by 6.1 percent, and that of exports dropped by 4.1 percent.

4. Commodity Markets

On the basis of developing industrial and agricultural production, commodity circulation has been further enlarged, market systems have been gradually improved, and the role of purchases and sales has been enhanced. In 1987 the total purchase volume of trade commodities reached 10.888 billion yuan, a 14.4-percent increase over the 1986 figure, and total sales reached 9.945 billion yuan, a 13.7-percent increase over the 1986 figure. The gross value of commodities imported from outside places reached 5.62 billion yuan, an 11-percent increase over the 1986 figure, and that of commodities sold to

outside places reached 9.268 billion yuan, a 3.2-percent increase over the 1986 figure. Sources of most industrial commodities were sufficient, and those of non-staple foodstuffs were relatively strained. The volume of introduced sugar, pork, and eggs showed a 7.2-percent decrease to 29 percent over the 1986 figure.

Retail markets have been steadily brisk. In 1987 the retail sale of social commodities reached 10.253 billion yuan, a 17.6-percent increase over the 1986 figure and a 10-percent increase if price hikes are excluded. Of this total sale of social commodities, that of the means of agricultural production reached 696 million yuan, a 20.1-percent increase over the 1986 figure, and that of social consumer goods reached 9.557 billion yuan, a 17.4-percent increase over the 1986 figure. Of this total sale of social consumer goods, sales to residents reached 8.181 billion yuan, a 17;1-percent increase over the 1986 figure, and sales to social institutions reached 1.376 billion yuan, a 19-percent increase over the 1986 figure.

The retail sale of commodities turned out by various industrial enterprises has increased. Of this increase, those commodities produced by the state-run enterprises showed a 10.5 percent increase; those produced by collectively run enterprises, a 20.7-percent increase; and those produced by individually run enterprises, a 35.2-percent increase.

The sale of commodities, such as foodstuffs, clothes, and daily necessities, has increased comprehensively. The sale of foodstuffs showed a 17.1-percent increase over the 1986 figure; the sale of clothes, a 13.7-percent increase; and the sale of daily necessities, a 20.3-percent increase. Excluding the factor of price hikes, these commodities showed an 8.3-percent, 7.4-percent, and 13.9-percent increase, respectively. In 1987 the obvious characteristic of retail markets was that the sale gap between the off season and peak periods obviously became small. Markets selling seasonal commodities, such as melons, fruits, and new-style clothes enjoyed brisk sales throughout the year; and the masses went shopping everyday.

Reforms in commercial systems have been increasingly deepened. By the end of 1987, more than 40 percent of large and medium-sized industrial and commercial enterprises enforced manager (plant director) responsibility systems. The municipality's 1,486 state-run small enterprises, such as retail firms, catering trade, and service centers, conducted reforms and changed their business or enforced the rental system, which accounted for 70.13 percent of the total number of such enterprises throughout the municipality. Of these small enterprises, 1,019 enforced the rental system and 14 collectively run small stores were sold to individuals. In line with their own actual situation, wholesale enterprises and large retail stores also actively enforced various business responsibility systems.

Economic results scored by the state-run commercial firms and supply and marketing cooperatives have increased somewhat. In 1987 they realized 294 million yuan in profits, a 3.1 percent increase over the 1986 figure. The circulating period of funds was shortened from 147 days to 131 days. The labor efficiency of staff members and workers was 38,760 yuan, a 15.6 percent increase over the 1986 figure; however, the standard of their expenses increased from 6.84 percent in 1986 to 6.95 percent in 1987.

The raised retail price index has been brought under control within the state plan. The 1987 general retail price index showed a 6.9-percent increase over the 1986 figure, which was lower than the 7.2-percent increase scored in 1986 and the 9.1-percent increase scored in urban retail price hikes throughout the country. Judging from the price hike of various commodities, that of foodstuffs was larger—8.3 percent. (Of this price hike, that of meat, poultry, and eggs was 5.3 percent; that of vegetables, 18 percent; and that of aquatic products, 23.5 percent.) The price hike of clothes was 5.9 percent, and that of daily commodities was 5.6 percent.

5. Foreign Economic Relations and Tourism.

The export trade expanded substantially. The value of exports through ports in 1987 totalled $1.512 billion, showing an increase of 20.3 percent over 1986 and reaching a peak since 1983. The proportion of industrial products to be exported in the total export value rose from 75 percent in 1986 to 78 percent. The 1987 export transaction volume amounted to $2.125 billion, an increase of 8.7 percent. The municipality made new progress in conducting the work of supporting exports with imports. The foreign exchange used to support exports with imports in 1987 increased 85 percent over 1986. The sources of commodities to be exported increased. The total value of commodities purchased for exports amounted to 3.476 billion yuan (planned prices), an increase of 9.4 percent over 1986.

Along with the further improvement in the investment environment, the municipality has made comparatively rapid progress in using foreign capital. A total of 135 agreements on using foreign capital were approved in 1987, an increase of 34 over 1986. Of this, 50 cooperative enterprises and joint ventures were developed with investment directly provided by foreign firms, showing an increase over 1986. Some $362 million in foreign capital was actually used in 1987 (including the loans which were borrowed under a unified plan but should be returned by the users themselves), an increase of 110 percent. Of this, the investment directly made by foreign firms reached $127 million, an increase of approximately 200 percent over 1986.

Fifty-one new joint ventures opened in 1987; thus, the municipality had 135 joint ventures. Seventy-six industrial enterprises realized 710 million yuan of output value, netted 639 million yuan of sales income, earned

76 million yuan in profits, and handed over 45 million yuan in taxes, for an increase of 103 percent, 92.8 percent, 23.1 percent, and 98.3 percent, respectively.

The pace of construction of the economic and technological development zone was accelerated. The infrastructural facilities of industrial areas covering an area of 3 square km were basically coordinated, and small living quarters covering an area of 1.9 square km were basically completed. This has created a comparatively good environment for foreign investors. The economic and technological development zone signed 34 contracts on building wholly foreign-owned enterprises, Sino-foreign joint ventures, and Sino-foreign contractural joint ventures; thus, the development zone signed a total of 85 contracts of this kind and brought in $120 million in foreign investment. In 1987, 26 new enterprises of these three types opened; thus, the economic and technological development zone had 38 enterprises of these three types. The industrial output value realized by these enterprises in the development zone amounted to 174 million yuan and created $16 million in foreign exchange through exports.

The international tourist trade flourished. In 1987 Tianjin attracted 90,800 foreign visitors, overseas Chinese, and compatriots from Hong Kong, Macao, and Taiwan, an increase of 64.6 percent over 1986. Of these visitors, 66,400 were foreigners and 24,400 were overseas Chinese and compatriots from Hong Kong, Macao, and Taiwan, an increase of 75 percent and 41.7 percent, respectively. Foreign exchange earnings through tourism reached 91.21 million yuan, an increase of 26.1 percent over 1986. In 1987 the municipality set records for the number of tourists and the amount of foreign exchange earnings.

6. Investment in Fixed Assets and the Building Industry

Through conscientiously implementing the policy of the "three guarantees and three restrictions" in line with the campaign of increasing production, practicing economy, increasing revenues, and reducing expenditures, the municipality stopped and suspended the construction of some nonproductive projects in the beginning of 1987. Meanwhile, we also strengthened the management of investment and strictly controlled construction areas and new construction projects. As a result, the trend of rapidly expanding investments was put under control. The total investment in fixed assets reached 6.426 billion yuan, an increase of 0.05 percent over 1986, just a little more than in 1986. If factors for material price hikes were included, the scale of investment was narrowed in reality. Of this, the local investment was 4.318 billion yuan, a drop of 217 million yuan, or 4.8 percent, from 1986. Of the total investment in fixed assets, the investment in capital construction increased by 13.9 percent and the investment in equipment renewal and technological transformation was reduced by 11.6 percent.

The investment pattern was improved, with the investment in productive projects being increased and that in nonproductive projects being reduced. The investment in productive projects throughout the municipality totaled 4.674 billion yuan, up 4.3 percent from the previous year; that in nonproductive projects totaled 1.752 billion yuan, down 9.7 percent; and the proportion of the investment in productive projects rose from 69.8 percent in the previous year to 72.7 percent. Emphasis of the investment was placed on energy, and basic material industries, and transportation. The investment made by industrial departments totaled 3.698 billion yuan, up 3.4 percent from the previous year. Of the total, the investment in power production and power supply was 323 million yuan, an increase of 79.3 percent over the previous year, and that in the petroleum industry was 1.097 billion yuan, an increase of 11.4 percent. Transport and post and telecommunications departments made an investment of 855 million yuan, rising by 39.3 percent over the previous year.

Key construction projects proceeded smoothly. The investment made in the 113 key construction projects of the municipality totaled 2.501 billion yuan, accounting for 95.7 percent of the annual target, and that in the 28 large and medium-sized projects totaled 1.729 billion yuan, accounting for 90.7 percent of the annual target. Four entire projects and five single-item projects were started and completed in the same year. Newly added production capacity included mainly 50,000 kilowatts of power generating capacity, 500,000 tons of daily tap water supply, 600,000 cubic meters of daily gas supply, 131,300 tons of crude oil, 2,500 tons of sumithion [as received], 180,000 tons of cracking equipment treatment capacity, 21,500 lines of local telephone switchboard, and 150,000 tons of soda ash.

Major problems in the investment in fixed assets were a rather large number of technical transformation projects that should have been carried out by old enterprises, and a failure to make industrial production suit the needs of developing an export-oriented economy.

New developments were achieved in reforming the system of construction enterprises. After applying the tender invitation and contract systems to their management, some construction units began to adopt the overall contract for designing, construction and scientific research, thus enabling some enterprises to establish in its initial form an intellectual resource-intensive management level, and improve economic results. In 1987 the multiformed contract responsibility system was applied to 5,568 of the 6,427 unit projects undertaken by construction units, amounting to 86.6 percent. The 1987 output value of the construction undertaken by construction enterprises throughout the municipality totaled 2.954 billion yuan, increasing by 7 percent over the previous year, and their per-capita productivity was 12,460 yuan, an increase of 8 percent.

7. Urban Construction and Public Utilities

New progress was made in urban construction, and the city's functions were further enhanced. The civic cook-

ing-use gas supply project was completed one year ahead of schedule. the 71.44-km outer ring road officially opened to traffic on 1 October, thus notably improving the traffic conditions of the city. Completion of the 3.2 million square meters of housing, hotel street, the garment sales exhibition center, the Xinkaihe water works' water supply project, and the single-story housing renovation project according to schedule enabled the living environment for the people to improve continuously.

New progress was made in the municipal administration construction. By the end of 1987, the number of bridges had reached 145. The total length of the paved roads newly built and renovated in the year was 110 km, the year-end total length of paved roads was 2,901 km, and the year-end total sewer length was 2,162 km.

Urban public transportation improved. In 1987, 11 public transport service lines were opened. The year-end number of public buses and streetcars was 1,867, and that of service lines was 150, totaling 2,886 km. The annual number of passengers totaled 805 million.

New features appeared in greening and beautifying the city. A total of 41 small green areas were built, the acreage of urban parks and green areas reached 1,563.5 hectares, and the average per-capita green area was 1.85 square meters, increasing by 0.16 square meter over the previous year.

8. Science, Education, Culture, Public Health, and Sports

The role of science and technology in economic construction becomes increasingly more prominent each day. In 1987 the municipality made 588 major scientific and technological research findings and won 14 state invention prizes. The technology market was becoming increasingly more brisk. In 1987 some 8,569 contracts on the technology market, with 198 million yuan involved, were signed. An analysis of 103 major projects showed that, when these projects are completed, 255 million yuan of output value and 94 million yuan in profits and taxes would be created. The ranks of science professionals and technicians expanded continuously. By the end of 1987, state units had 214,700 natural science professionals and technicians, an increase of 11,400 over 1986.

Education was further developed. In 1987 some 1,446 postgraduates were newly recruited, a drop of 18 from 1986. Some 4,227 students were enrolled in postgraduate schools, an increase of 401 students over 1986; and 963 postgraduates were graduated in 1987, an increase of 337. The ordinary high schools recruited 14,900 students, an increase of 930 students; the enrollment in ordinary high schools reached 50,700 students, an increase of 2,215; and 12,500 students were graduated from these schools, an increase of 1,863. The secondary educational structure tended to be reasonable. Some 458,500 students were enrolled in various kinds of secondary schools, an increase of 6,500 students. Of this, the enrollment in various kinds of vocational and technical schools reached 83,300 students, an increase of 2,900 students over 1986. The proportion of the vocational and technical schools' enrollment in the total enrollment in senior high schools rose from 50.5 percent in 1986 to 54.3 percent. Primary-school education became popular, and 99.7 percent of school-age children attended schools, an increase of 930 children over 1986. The enrollment in primary schools reached 733,000 pupils, an increase of 2,600 over 1986. Pre-school education was developed. The enrollment in adult high schools was 52,000 students and that in secondary specialized schools was 35,700 students.

Cultural undertakings improved greatly. In 1987 some 1,027 films were shown. Of this, 613, or 60 percent, were feature films produced by China. There were 225,000 film showings with 154 million viewers. Performing art troupes created 32 new plays and operas and gave 6,333 performances with 7.92 million viewers. New colors were added to the traditional operas of the motherland, which can make the people become younger and more vigorous, including the Beijing Opera, North and Northeast China local operas, and the Hebei opera. The Channel No. 17 literary and artistic television station has been subjected to every kind of welcome since its operation began 1 year ago. New trails were blazed in broadcast radio and television programs. There were 1,859 kinds of new books. A total of 174 million copies of books were published in 1987, an increase of 6.8 percent over 1986. There were 145 kinds of magazines. A total of 92 million copies of magazines were published, an increase of 4.1 percent. There were 23 kinds of newspapers and 571 million copies of newspapers were published, an increase of 8.8 percent.

New progress was made in public health and medical undertakings. There were 28,371 hospital sickbeds in 1987, an increase of 1,124 over 1986. The number of hospital beds rose from 3.34 per thousand in 1986 to 3.42 per thousand. There were 63,067 specialized public health workers and technicians, an increase of 170 people over 1986. Of this, 27,222 were doctors, an increase of 472. Thus, each 1,000 people could be served by 3.28 doctors.

Sports activities were extensively launched. A total of 818 sporting events with the participation of 438,000 athletes were held in the municipality in 1987. Of this, 28 sporting events with the participation of 75,000 athletes were sponsored by the provincial- and city-level units. Athletes set four national records, two more than in 1986. At the sixth national sports games, Tianjin's sports teams won 24 medals, including 7 gold medals. Tianjin ranked 19th in terms of the number of the gold medals won at the national games, which is not suitable for Tianjin's position.

9. Living Standards

The livelihood and environment of both urban and rural people have been further improved. By the end of 1987,

the Municipal People's Government totally fulfilled its plan for improving the people's livelihood by doing 20 practical deeds for the masses. Since 1983 the municipal authorities have done 90 practical deeds for both urban and rural people and fulfilled or improved these deeds one by one each year, bringing about unity and high spirit among the masses and a gratifying situation of social stability and peace.

Labor systems have been improved and labor employment has increased. In 1987 the municipality made job arrangements for 45,000 urban jobless personnel. At the end of 1987, the municipality had 2.815 million staff members and workers, a 13,000 person increase over the 1986 figure. Of these staff members and workers, 129,000 persons were employed by the state-run enterprises in line with the contract system, a 23,000 person increase over the 1986 figure. The number of urban self-employed workers reached 51,000, an 8,000 person increase over the 1986 figure. In 1987 the municipality's expenditure for wages of staff members and workers was 4.286 billion yuan, a 464 million yuan and 12.1 percent increase over the 1986 figure. Per capita annual wages were 1,535 yuan, an 11.2 percent increase over the 1986 figure.

On the basis of developing production, incomes of both urban and rural people have continuously increased. The data of sample investigation conducted among every thousand households has shown that the per capita living expense income of urban residents in 1987 was 1,094.65 yuan, a 106.22 yuan and 10.7 percent increase over the 1986 figure or a 3.7 percent practical increase if the factor of price hikes is excluded. The data of sample investigation conducted among farm households has shown that the per peasant net income in 1987 was 749.41 yuan, a 114.24 yuan and 18 percent increase over the 1986 figure.

The consumption standard has been continuously upgraded. The per capita living expense of urban residents in 1987 was 1,071.14 yuan, a 12.9 percent increase over the 1986 figure and a 5.7 percent increase if the factor of price hikes is excluded. Products of catering trade, clothes, and daily necessities are continuously being improved as fine-quality and high-grade commodities. The per capita consumption expense of farm households was 523.48 yuan, a 12.2 percent increase over the 1986 figure.

The property possessed by resident households has continuously increased. The gross value (calculated in term of purchase value) of property possessed by every urban household in 1987 was 3,880 yuan, a 17.2 percent increase over the 1986 figure. Every 100 households possessed 238.1 bicycles, 334 watches, 86.3 sewing machines, 77.2 washing machines, 73.4 recorders, 122 television sets (of which 41 are color sets), 39 refrigerators, and 29.9 cameras. (More)

Conditions for housing of urban and rural dwellers improved. At the end of 1987, the per-capita housing space of urban dwellers increased by 0.11 square meters; and the per-capita housing space of peasant households was 1.53 square meters over the 1986 figure.

Savings deposits of urban and rural dwellers increased substantially. By the end of 1987, individuals' bank savings amounted to 5.495 billion yuan, 1.443 billion yuan or 35.6 percent more than the 1986 year-end figure. Of this, savings deposits of urban dwellers increased by 1.134 billion yuan or 34.9 percent; and those of rural residents went up by 3091 million yuan or 38.4 percent.

A sample survey of urban residences shows: The real living standards of some urban dwellers of the municipality declined in 1987. Household income of some residents decreased due to the changes in the status of family members and in the management of enterprises. Although 17.5 percent of households in the municipality witnessed an increase in their per-capita income available for living expenses, the increase rate was lower than the increase rate in commodity prices.

Social welfare services continued to improve. At the end of 1987, social welfare establishments in urban areas provided for 1,135 elderly, disabled, orphans, and mental patients. The collectively owned economic departments in rural areas provided for 6,641 elderly, disabled, and orphans, of whom, 2,537 were provided by old folks' homes. The rural areas scored outstanding achievements in "supporting poor households and areas." In 1987, 8,731 households newly extricated themselves from poverty.

10. Population

By the end of 1987, the municipality had 8,287,300 people, 137,600 or 1.7 percent more than the 1986 year-end figure. Of this, 5,522,100 people lived in districts under the jurisdiction of the municipal authorities, 84,300 more than 1986, (3,448,100 people lived in the 6 districts in the city proper, an increase of 52,200 people); and 2,765,200 people lived in the counties under the jurisdiction of the municipal authorities, an increase of 53,300 people over the 1986 figure.

According to a sample survey of 1 percent of the population, the municipality's birth rate in 1987 was 17.07 per thousand, and the mortality rate was 6.08 per thousand, yielding a natural growth rate of 10.99 per thousand.

Note 1: Gross national product and national income listed here are preliminary statistics. Their absolute value is calculated in terms of current prices, and the rates of growth are calculated in terms of comparable prices.

Note 2: The total product of rural society and the growth rate are calculated according to current prices.

Yunnan 1987 Economic Statistics

HK2105093088 Kunming YUNNAN RIBAO in Chinese 8 Apr 88 p 2

["Statistical Communique on Economic and Social Development in 1987, Issued by the Yunnan Provincial Statistical Bureau"]

[Text] In 1987, under the leadership of the provincial party committee and the provincial government, the people of various nationalities in Yunnan launched an extensive "double economy and double increase drive," further opened the province to the world, and tried to deepen the reforms. As a result, production steadily developed, the markets thrived, progress was made in external economic and technological exchanges, and science and technology, culture, education, public health service, and sports developed. According to initial reckoning, the province's GNP (1) last year was 20,686 million yuan, an 11.3 percent increase over the previous year, and national income was 18,036 million yuan, a 10.6 percent increase. The main problems affecting national economic development were the rather shaky foundation of agriculture, the inadequate supply of some commodities, and prices continued to rise.

I. Agriculture

In spite of frequent natural calamities agricultural production developed. In 1987, the province's gross agricultural output value was 11,125 million yuan, 6.1 percent up on the previous year. The gross agricultural output value of the nationality autonomous areas (including the province's 8 nationality autonomous prefectures and 19 nationality autonomous counties) increased by 7.7 percent.

Last year's grain output was 9,348,400 tons, 648,400 tons more than the previous year. This put an end to the decreasing grain output of the previous 2 years. The output of various industrial crops, such as oil-bearing crops, flue-cured tobacco, sugar cane, and tea, increased in varying degrees.

The output of major farm products was as follows:

	1987	Percentage increase over 1986
Grain	9,348,400 tons	7.5
Oil-bearing crops	135,200 tons	23.1
of which:		
Rapeseed	100,300 tons	49.7
Sugar cane	5,584,700 tons	5.5
Flue-cured tobacco	335,600 tons	17.3
Tea	39,200 tons	15.0
Silkworm cocoons	1,805 tons	12.7
Fruit	316,300 tons	5.1

The province was able to further arouse the people's enthusiasm for building and protecting forests. As a result, the quality of forests improved and the output of forest products increased. The output of rubber increased by 14.6 percent; that of tea oil tree seed, 16.1 percent; rosin, 70.4 percent; walnuts, 34 percent; Chinese chestnuts, 26.2 percent; and tung oil tree seed, 2.8 percent. The output of raw lacquer and shellac decreased. In some parts of the province there were still people who felled trees in an unruly way.

The numbers of large animals, sheep, goats, and pigs were all increased by the end of last year, and output of pork also increased. However, the increase in meat output was not big enough to counteract the growth inf consumption and meat supply was therefore quite strained. The output of major animal by-products and head of livestock was as follows:

	1987	Percentage increase over 1986
Pork, beef, and mutton	596,200 tons	5.1
of which:		
Pork	562,100 tons	4.3
Milk	56,700 tons	18.4
Pigs slaughtered	7,254,000 head	1.3
Large animals at year end	9,233,000 head	2.1
Pigs at year end	18,213,000 head	6.3
Sheep and goats at year end	6,995,000 head	2.1

There was a fairly rapid growth in fishery production. In 1987, the province's total output of aquatic products was 38,100 tons, a 22.1 percent increase over the previous year.

Agricultural input increased and conditions for agricultural production improved. At the end of 1987 the aggregate power capacity of the province's farm machines reached 5.13 billion watts, an 8.1 percent increase over the previous year. The number of small, hand-held tractors was 100,000, 16 percent more than in 1986, and the number of heavy duty trucks was 14,700, a 15.9 percent increase over the previous year. The number of sets of irrigation and drainage equipment was 43,000, a 4.3 percent increase over the previous year. The total amount of chemical fertilizer applied was 1,766,000 tons, a 1.2 percent increase over 1986. The total consumption of electricity in the countryside was 870 million kwh, an 8.5 percent increase over 1986. The total area of land under effective irrigation was 973,000 hectares, 0.7 percent more than in the previous year. However, last year the foundation of agriculture was still quite shaky, not enough resources were reserved for future development, and the production of the major agricultural products still could not meet economic development requirements and the people's growing needs.

The rural reforms were further deepened. In 1987, the total product of society in the countryside (2) was 15,092 million yuan, a 9.6 percent increase over the previous

year. Of this sum, 3,865 million yuan was from the building industry, transportation services, and the public catering trade. Together, their proportion of the total product of society in the countryside rose from 25.4 percent in 1986 to 26.2 percent in 1987. The proportion of the rural labor force employed in secondary and tertiary industries to the entire rural labor force rose to 9.2 percent.

II. Industry

Industrial production grew steadily. In 1987, the province's gross industrial output value was 18,185 million yuan, a 16.7 percent increase, or 17,272 million yuan excluding the output value of industries at village level or below, a 16.3 percent increase. This excludes the increase in the output value of industries at village level or below over the previous year. The gross output value of state-owned industry increased by 15.6 percent, that of collective industry by 18.8 percent, that of individually run industry increased by 28.7 percent, and that of other types of industry increased by 20.8 percent.

The gross output value of industrial enterprises at township level or above in nationality autonomous areas was 14.9 percent higher than in the previous year. The development of heavy and light industry was balanced. In 1987, the province's light industrial output value was 8,566 million yuan, a 19.1 percent increase over the previous year, and its heavy industrial output value was 9,619 million yuan, a 14.5 percent increase. The ratio of light industrial output value to heavy industrial output value was 48.6:51.4. As two of the province's most important industries, the tobacco and sugar industries developed most rapidly. Their combined output value constituted about one-fifth of the province's gross industrial output value. The power industry and agriculture aid industries also developed rapidly. The production of raw and processed materials grew steadily. However, there was still the problem of the industrial production mix not being in accord with the demand mix.

The output of major industrial products was as follows:

	1987	Percentage increase over 1986
Yarn	41,100 tons	3.0
Cloth	174,470,000 meters	3.9
Woolen Piece goods	569,800 meters	-17.1
Machine-made paper and paper boards	116,600 tons	8.7
Sugar	535,400 tons	16.5
Cigarettes	3,002,400 cartons	27.4
Refined tea	30,339 tons	14.9
Bicycles	459,400	22.6
Television sets	106,400	98.1
of which:		
Color television sets	45,100	24.2
Tape recorders	11,700	72.0
Household washing machines	55,300	10.6
Household sewing machines	85,000	48.5
Household refrigerator	43,600	74.4
Coal	19,460,000 tons	14.5
Electricity	9,433,000,000 kwh	11.6
of which: Hydroelectricity	5,013,000,000 kwh	-0.02
Steel	619,600 tons	11.0
Finished steel products	501,900 tons	6.61
nonferrous metals	176,500 tons	10.1
Cement	3,933,100 tons	15.5
Timber	3,559,900 cubic meters	4.3
Plate glass	920,100 standard cases	-12.9
Sulphuric acid	324,200 tons	22.9
Caustic soda	22,105 tons	2.6
Chemical fertilizer	708,900 tons l	11.7
Power generating equipment	41,700 kw	-16.1
Machine tools	3,296	-4.8
Motor vehicles	8,175	120.0
Hand-helped tractors	14,234	42.2

By further deepening their reforms industrial enterprises were able to further improve their economic results. Last year, the total amount of profits and taxes collected from budgeted state-owned industrial enterprises was 1,202 million yuan, a 11.7 percent increase over the previous year. The turnover period for their fixed amounts of working funds was 6.7 days shorter than in 1986, and their per capita labor productivity was 12.7 percent higher. The quality of most products improved steadily and energy consumption decreased. The total amount of energy saved by the industrial departments was equivalent to 68,000 tons of standard coal and the total amount of energy consumed por the production of each 10,000 yuan's worth of products was 1 percent smaller than in the previous year. Industrial enterprises began to shift their attention to reform of their internal mechanisms. In 1987, 47.3 percent of state-owned industrial enterprises practiced the system whereby the plant director assumed full responsibility; 70.8 percent of the large- and medium-sized state-owned industrial enterprises practiced the contracted management responsibility system; and 6.2 percent of the small state-owned industrial enterprises beczme collectively run enterprises or ones run by individuals on a contract or lease basis. These figures were far below the national average. Lateral economic integration developed and its scope expanded and forms increased. By the end of 1987, 347 industrial enterprises had joined various types of lateral organizations. The total amount of capital involved was 212 million yuan. The total amount of their profits last year was 14.7 percent larger than in the previous year and their productivity was 15.5 percent higher. Both increase rates were higher than the national average.

III.Investment in Fixed Assets and the Building Industry

Investment in fixed assets was kept under control and increased only very slightly. In 1987, the province's investment in fixed assets totalled 5,272 million yuan, 127 million yuan, or 2.5 percent, more than in the previous year. This growth rate was lower thzn the 7.2 percent of 1986. Of this sum, 3,626 million yuan was contributed by state-owned units, 927 million yuan by collectively owned units, and 719 million yuan by individuals. Quite a number of new projects were launched.

Investment distribution changed for the better. Investment in capital construction by state-owned units totalled 1,993 million yuan, roughly equal to that in the previous year. Investment in productive construction projects totalled 1,179 million yuan, up 2.3 percent from the previous year, and its proportion of the total amount of investment in construction projects rose from 57.9 percent in 1986 to 59.2 percent. Investment in nonproductive construction projects amounted to 813 million yuan, 2.9 percent less than in the previous year, and its proportion of the total amount of investment in construction projects dropped from 42.1 percent in 1986 to 40.8 percent. Of the total amount of investments,)516 million yuan went to the energy and industry departments, 12.4 percent more than in the previous year. Of this sum, 477 million yuan was invested in electricity projects. Investment in the agriculture, forestry, water works, and meteorological departments amounted to 190 million, 7 percent more than in the previous year, and its proportion of the total amount of investments rose from 8.9 percent in 1986 to 9.5 percent. Of the total amount of investments, 51.5 million yuan went to the light and textile industry departments, 13 percent more than in the previous year; and 142 million yuan went to the education departments, 3.8 percent more than in 1986, and its proportion of the total amount of investments rose from 6.9 percent in the previous year to 7.1 percent. Investment in nonproductive construction projects was a little too much, whereas that in transportation, postal, and telecommunications services was a little too modest. Investment distribution should be further readjusted.

The pace of the execution of key construction projects quickened. In 1987, 666 million yuan was invested in the province's 21 large and medium ongoing key construction projects. With the exception of a few, all yearly execution plans were fulfilled. Smooth progress was made in construction of the Lubuge Power Plant, which was arranged on the principle of setting reasonable time limits for projects. It is estimated that its first set of generators will be put into operation and connected to the supply network by the end of 1988. The flow of the river on which the Manwan Hydroelectric Power Station is to be constructed was successfully stopped on 20 December, 1 year ahead of schedule. Last year, the province's capital construction investment helped add the following production capacities: Generators with a total installed capacity of 212,900 kw, 900,000 tons of phosphate rocks, 1,100 tons of concentrate tin ore, 1,200 tons of concentrate lead ore, 80,000 tons of iron orexn qtnppp cubic meters of plywood, and 9,000 tons of machine-made sugar.

The enterprises devoted further efforts to technical transformation. In 1987, state-owned units invested 1,425 million yuan in technical renovation and transformation, 135 million yuan, or 10.5 percent, more than in 1986. Of this sum, 186 million yuan was spent on increasing the variety of goods, 87 percent more than in the previous year, and 65 million was spent on improving the quality of products, 1.5 percent more than in 1986. Last year, 1,453 technical transformation projects were completed and put into operation. The value of the fixed assets thus added was 984 million yuan.

Efforts were made to deepen the reform of the building industry and the enterprises tried unremittingly to perfect the internal contracted management responsibility system. Last year, 7,583 projects, or 94 percent of the total number of projects, were undertaken by staoe-owned building construction enterprises on the basis of various contracted economic responsibility systems. These projects covered sites with a total area of 4.09 million square meters, which was equal to 86.3 percent of the total area of all sites, or 94 percent of the total actual construction area. Of these projects, 623 were undertaken through tenders and covered sites with a total area of 696,000 square meters, which was equal to 14.7 percent of the total actual construction area. Reforms stimulated the development of production. In 1987, the output value of the state-run building industry totalled 1.37 billion yuan, a 13 percent increase over the previous year and its per capita productivity was a record 8,243 yuan, 12.3 percent higher than in 1986. The coefficient of wages for each 100 yuan's worth of finished work dropped from 19.3 percent in 1986 to 18.1 percent in 1987. Much money was thus saved for the country. l Progress was made in prospecting for mineral resources. In 1987, 7 types of mineral ore deposits were discovered at 18 points and the reserves of 7 types of major minerals were verified. Tunnelling footage completed last year totalled 167,000 meters.

IV. Posts and Telecommunications and Transportation

Last year, the transportation departments deepened the reforms and devoted further efforts to technical transformation, thus enhancing their transportation capability. The volume of freight and the number of passengers transported by various means of transportation increased.

	1987	Percentage increase over 1986
Rotation volume of freight		
Railroads	7,900 million ton-km	13.3

	1987	Percentage increase over 1986
Roads	2,347 million ton-km	5.1
Waterways	58 million ton-km	48.3
Air	8 million ton-km	41.0
Passenger volume		
Railroads	2,205 million person-km	11.1
Roads	5,992 million person-km	4.1
Waterways	50 million person-km	12.7
Air	474 million person-km	29.0

The province's postal and telecommunications services steadily developed. In 1987, transactions amounted to 80 million yuan, up 13.4 percent from the previous year. At the end of last year, the total number of telephone subscribers in the urban areas was 45,000, a 6.9 percent increase over the previous year. In 1987, the province inaugurated its inland express mail service which handled 1,252 letters and parcels last yeay. Last year, the province's new radio paging service had 418 subscribers and savings deposits at the post offices totalled 58,697,000 yuan, five times more than in the previous year. Although the strains on the communications, transportation, and telecommunications services were alleviated somewhat, they were still not well adapted to the development of the economy.

V. Domestic Commerce and the Supply and Marketing of Goods and Materials

Urban and rural markets thrived. In 1987, the total volume of retail sales in society was 11,335 million yuan, a 12.1 percent increase or an actual increase of 5.2 percent, if price increases are factored in, over the previous year. Of this, 10,255 million yuan was the value of the retail sales of consumer goods, up 11.6 percent from the previous year. The volume of retail sales to the province's citizens increased by 11.5 percent and that of retail sales to social groups went up by 13.4 percent. The total value of the retail sales of means of agricultural production was 1,080 million yuan, up 17;6 percent from the previous year. The volume of retail sales in all sectors, except the individual sector, of the economy increased. The value of the retail sales by state-owned units increased by 18.6 percent, that of the retail sales by collectively owned units by 11.9 percent, and that of the retail sales by cooperative economic organizations [he ying jing ji 0678 3602 4842 3444] by 2.2 times. The volume of retail sales by peasants to the non-agrarian population rose by 22.1 percent, and the volume of retail sales of commodities in the nationality autonomous areas was 15.9 percent larger than in the previous year.

The volume of the retail sales of all types of consumer goods increased. The supply of all types of foodstuffs, except pork, eggs, and a few non-staple foodstuffs, was quite plentiful, and the volume of their retail sales rose by 14.1 percent (or 4.0 percent if price increases are factored in), that of clmthing by 10.2 percent, and that of tools, utensils, and expendables went up 8.4 percent.

The reform of the commercial system developed and lateral economic associations expanded. By the end of 1987, over 60 percent of the large- and medium-sized state-owned commercial enterprises had applied the contracted management responsibility system, and 88 percent of the small state-owned commercial enterprises had become collectively run enterprises or collectively owned enterprises run by individuals on a lease basis. Last year, 507 commercial enterprises in the province joined various economic associations, 17 percent more than in the previous year, and the total amount of profits from these economic associations increased 1.6 times. The volume of country fair trade totalled 3,018 million yuan, a 16.6 percent increase over the previous year.

The economic results of state-owned commercial units and supply and marketing cooperatives improved. In 1987, the total amount of their profits increased 2.1 times, the time for the turnover of their merchandise and funds was 8 days shorter than in the previous year, the volume of their commodity sales increased by 13.7 percent, and the average amount of goods sold by each of their workers increased by 11.6 percent. However, the expenses incurred in the sale of each 100 yuan's worth of commodities was 0.33 percent higher in 1987 than in 1986.

Last year, as a result of the reform of the system governing the management of the distribution of goods and materials, the scope of market regulation expanded and less goods and materials were distributed according to state plans. The proportion of steel products distributed according to state plans dropped from 64 percent in the previous year to 57.85 percent, that of cement from 57 percent to 32.2 percent, and that of timber from 37.3 percent to 30.05 percent. The totab volume of sales by the goods and materials departments was 2,078 million yuan, a 15.19 percent increase over the previous year. Of this, 293 million yuan was for sales by goods and materials trade centers, 57.15 percent higher than that in 1986. Prices rose rather sharply. In 1987, the generalh retail price index rose 6.6 percent over the previous year. It rose by 7.3 percent in the cities and towns and by 6.1 percent in the countryside. The price of food in general rose by 9.7 percent; meat, poultry, and eggs, 10.1 percent; fresh vegetables, 16.7 percent; aquatic products, 12.3 percent; garments, 1.2 percent; daily necessities, 4.9 percent; pharmaceuticals and medical equipment, 4.2 percent; service fees, 9.1 percent; medical and health service charges, 23.7 percent; and means of agricultural production, 5.5 percent.

In 1987, the cost of living index for staff members and workers rose 7.4 percent over the previous year.

Last year, the price index for the purchase of farm and sideline products rose 9.1 percent over the previous year.

Major price management problems included that some enterprises raised prices which without authorization in purchasing or selling commodities in short supply; and smme shops and individual vendors sold unmarketable commodities by resorting to dishonest practices, lied about the quality of their merchandise, or gave short measures.

VI. External Economic Relations and Tourism

The volume of the province's exports increased and the growth in its imports was kept under control. According to a statistical report prepared by the Economic and Trade Affairs Office, the total volume of Yunnan's exports and imports last year was $342 million, a 28.9 percent over over the previous year. The total volume of its exports was $262 million, a 55.2 percent increase over the previous year, whereas the total volume of its imports was $79.91 million, 17.1 percent lower than in 1986.

More foreign exchange income was derived from sources other than foreign trade. In 1987, the total amount of foreign exchange income derived from sources other than foreign trade was $22.09)million, a 52.7 percent increase over the previous year. The expenses incurred totalled $8.3 million, a 190 percent increase over the previous year.

More foreign capital was used last year than ever before. In 1987, the province used $9.15 million of foreign capital, 58 percent more than in the previous year. Of this, $4.8 million was direct investment by foreign businessmen, 35.5 percent more than in the previous year. The total volume of compensation trade last year was $1.53 million.

Further advances were made in economic and technical cooperation with foreign countries. In 1987, the province signed 17 contracts for overseas engineering projects and labor service, altogether worth $3.12 million. In the same year, the province also fulfilled contracts valued at $10.21 million, a 65.9 percent increase over the previous year.

Tourism also developed. In 1987, a total of 113,600 people from more than 50 countries and regions came to Yunnan on tours and visits and for various types of exchanges, 7.8 percent more than in 1986. There were 74,800 foreigners and 28,800 Hong Kong, Macao, and Taiwan compatriots, a 6.6 percent increase over the previous year. The total amount of foreign exchange income derived from tourism was 40.48 million yuan (in foreign exchange certificates), a little larger than that in the previous year.

VII. Science, Education, and Culture

Last year, the reform of the system governing scientific and technological work continued to develop and science and technology played an important role in socioeconomic development. In 1987, 112 scientific and technological research projects won prizes from the province and the province received two discovery and invention awards and one scientific advances award from the state. In 1987, of all the research projects and topics covered inlthe province's key scientific and technological research plans for the period of the "Seventh 5-Year Plan," 36 projects covering 95 research topics were completed and 89 contracts were signed for the execution of the rest. Of all the projects covered by the "Spark Plan," the purpose of which is to revitalize the rural economy, 2 were completed last year and 51 are being executed. The successful breeding of an Egyptian river loach on the sub-tropical plateau in Mengzi yielded remarkable economic results and social benefits and ecological benefits last year, and it is now being gradually introduced to other parts of the province.

Progress was made in issuing patents. Last year, 424 applications were processed, 1.3 times more than in the previous year, and 80 were approved, also 1.3 times more than in the previous year. The province's contingent of scientists and technicans continued to expand. In 1987, the province's state-owned units employed a total of 175,600 natural science professionals and technicians, 13,200 more than in thelprevious ytar, and there were 251,100 social science professionals in the province, 21,500 more than in 1986. At the end of last year, there were 153 state-owned independent research organizations at county or above levels and their total number of employees was 18,000.

Education further developed in the context of the reforms. In 1987, the province enrolled 342 postgraduate students. The total number of postgraduate students studying in the province thus rose to 1,013, and 322 completed their studies last year. Last year, 13,245 undergraduate students and students of professional subjects were admitted to the province's regular institutions of higher learning, 1,054 more than in the previous year. Last year, the total enrollment was 41,036, 8.9 percent more than in the previous year, and 9,806 graduated. In the same year, 5,506 undergraduate students and students of professional subjects were admitted to institutions op higher learning for mature students, and the total enrollment was 14,917.

The make up of secondary education became more rational. Last year, the province's regular secondary schools had a total of 1,173,000 students, 68,000, or 6.2 percent, more than in the previous year. Of these, 275,700 were from minority groups. The secondary vocational and technical schools had 129,500 students. Of these, 116,700, or 39.1 percent of the total number of senior secondary school students, were students at senior secondary vocational and technical schools. The secondary specialized schools for mature students had a total enrollment of 29,200.

Elementary education was further strengthened. Last year, the province's primary schools had a total enrollment of 4,993,800 students. Of these, 1,604,900 were from minority groups. Of the total number of school-age

children in the province, 94.3 percent, 0.7 percent more than the .3.6 percent in 1986, were enrolled. Pre-school education and education for the blind, the deaf, the mute, and the mentally retarded also developed.

Culture flourished. In 1987, the province produced two feature films. There were 7,352 film projection units, 147 performing art troupes, 128 cultural centers, 148 public libraries, 17 museums, 7 radio stations, 36 transmitting and relay stations, 6 television stations, and 22 television transmitting stations with a capacity of 1 kw each. A total of 217.42 million copies of provincial newspapers, 14.91 million copies of magazines, and 119.25 million copies (or sheets) of books were published last year.

VIII. Public Health and Sports

Public health and medical service further developed. In 1987, the province had 70,600 hospital beds, 2.9 percent more than in the previous year, and 94,400 professional health workers (the natwonality autonomous areas had another 42,500), a 5.1 percent increase over the previous year. These professional health workers included 45,700 doctors (including 18,000 practitioners of both Chinese and Western medicine), a 4.5 percent increase over the previous year, and 19,700 senior and ordinary nurses, an 8.9 percent increase. Progress was made in the prevention of acute and chronic communicable diseases and endemic diseases. However, medical services were generally unavailable in mountain and remote areas and 3.6 percent of the villages in the province did not even have clinics. Sports made further headway. In 1987, the province's athletes won 8 gold, 7 silver, and 11 bronze medals at the Sixth National Games. In addition, one of them came second in an international tournament. Mass sports activities developed with 1,060,000 participants in 3,020 county-level or above sports meets. Last year, 1,210,000 people reached the national standards for physical training and the province built 409 new sports facilities.

IX. People's Livelihood

The income of both urban and rural dwellers continued to increase, albeit at a reduced pace. In 1987, the annual wages of workers and staff members in the province totalled 3,727 million yuan, 423 million yuan, or 12.8 percent, more than in the previous year. A sample survey of some urban households showed an average annual per capita income of 914 yuan for living expenses, a 13.3 percent increase, or a 5.9 percent actual increase if price increases are factored in, over the previous year. However, according to another sample survey conducted in Kunming, the actual income of 15.4 percent of households decreased as a result of the price increases. The peasants' per capita net income was 365 yuan, a 7.8 percent increase, or a 3.8 percent actual increase if price increases are factored in, over the previous year. Of this per capita income, 333.11 yuan was derived from production, an 8.2 percent increase over the previous year. However, the annual per capita net income of 13.9 percent of peasant households in the countryside remained below 200 yuan.

The reform of the labor system developed and the number of people employed increased. In 1987, the cities and towns in the province provided jobs for 77,700. At the end of last year, the total numberlof staff members and workers in the province was 2,747,400, 66,900 more than at the end of 1986. Of this number 122,100 were employed by state-owned units on a contract basis, 36,700 more than in the previous year. Last year, the number of individual laborers in the cities and towns reached 118,600.

Urban and rural saving deposits increased rapidly. At the end of 1987, urban and rural savings totalled 5,546 million yuan, 1,570 million yuan, or 39.5 percent, more than at the end of 1986.

Housing for both urban and rural dwellers continued to improve. In 1987, 744,000 square meters of housing was completed in the cities and towns and another 13,251,000 square meters was completed in the countryside.

Social welfare services continued to improve. In 1987, there were 627 social welfare units providing for 6,618 people. Urban and rural collective units provided for 63,900 orphaned, elderly, or disabled peoplexm In 1987, thanks to the efforts of governments at various levels another 1 million or so people were able to shake off poverty and basically solve their food and clothing problems.

X. Population

The natural population growth rate dropped. According to a sample survey of 1 percent of the province's population and a follow-up survey in the second half of the year, in 1987 the growth rate of the province's population was 23.97 per thousand and the mortality rate 8.4 per thousand. The natural growth rate dropped from 18.09 per thousand in the previous year to 15.57 per thousand in 1987. At the end of last year, the province's total population was 35.34 million, 540,000 more than at the end of 1986.

Footnotes

1. All figures for GNP, national income, and various types of output value cited in this communique are calculated in terms of 1987 prices, and growth rates are calculated on comparable prices.

2. Total product of society includes the gross output value of agriculture and the gross output value registered by collective and individually run rural industries, the building industry, transportation service, and commerce in the countryside.

FINANCE, BANKING

Reasons for Price Increases in Anhui Province

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21 Mar 88 p 2

[Article by Lin Jiang [5259 3068]: "Reasons for Price Increases in Our Province and What to do About Them"]

[Text] As it concerns hundreds of millions of households, the issue of prices has become the most common conversation topic in town and country. How much have prices gone up in our province in recent years? What are the major reasons for the price increases? What appropriate steps should be taken? Recently I made an investigation.

With the reform of the irrational price system and the implementation of a number of economic measures, the overall price level in China has risen considerably in the past few years. According to statistics from departments concerned, in the 3 years from 1985 through 1987, the general retail price index increased by 23.6 percent over 1984 nationwide, and about 22 percent in Anhui. Between 1986 and 1987, the general retail price index in Anhui rose about 9.5 percent, of which only about 1 percent could be attributed to price readjustment measures implemented by state and local authorities, and the remaining 8.5 percent were spontaneous increases. Prices that increased sharply were those for vegetables, meats, eggs, and chemical fertilizers. The most seriously affected are, in urban areas, young and middle-aged workers and office staff, who have lower wages, fewer bonuses, and more mouths to feed, and, in rural areas, peasants who depend solely on growing grain crops and have no income from industrial or side occupations.

The major reasons for price increases are inflated demands and insufficient supplies. Specifically the causes are: 1. The scale of capital construction has gone beyond the limits of the country's financial and material resources, and too much money has been put in circulation. Anhui ranks rather low among the provinces in the amount of money invested in capital construction. Still, in the past year alone, 3.2 billion yuan was invested in capital construction by state-owned units in the province, and more than 40 percent of this amount will be turned into consumption funds and used to buy consumer goods in the market. 2. The product mix remains irrational, particularly the production of major nonstaple food items such as vegetables, meats, and eggs which cannot meet market demands. 3. Institutional consumption is increasing at a faster rate than individual consumption. From January through November last year, institutional purchasing power in the province added up to 1.13 billion yuan, a 21.5-percent increase over the previous year, higher than the 16-percent increase in individual purchasing power for the same period. 4. The introduction of various economic measures has led to many commodity price increases. For example, the proportion of raw and semifinished materials supplied under state plans at lower prices has been reduced, and the proportion purchased at negotiated prices outside of state plans has increased; commodities imported with state-owned foreign exchange are decreasing, while those imported with locally owned foreign exchange are increasing, and many imported commodities are sold at prices fixed by agents; and extra charges are added to the base prices of coal, power, and fuels when consumption exceeds specific levels, and consumers are also made to pay various charges, donations, and collections, which indirectly pushes prices up. 5. Price increases in neighboring provinces and cities also have an impact on Anhui. Several years ago, prices were more tightly controlled in Anhui, and increases were relatively small. In 1985, Anhui's general retail price index increased by 6.4 percent over 1984, the second lowest increase in China. In 1986, the index increased by 5.2 percent, putting Anhui in the 17th place nationwide. In 1987, with the decontrol of some commodity prices, the general price level in Anhui gradually rose to the same level as the neighboring provinces and cities. 6. In order to protect or expand their own economic benefits, some areas, departments, and enterprises have introduced unjustifiable price increases and arbitrary charges. 7. There is a lack of effective means to enforce price control. People investigating and handling price violations are more likely to face intercession than support. Failure to observe or enforce the law is still the rule rather than the exception. In a few places, not enough efforts are made to keep prices under control.

In the past year, the prices of a wide range of commodities have increased sharply, particularly nonstaple food items. The provincial government and other government organizations are extremely concerned about the situation, and measures have been introduced to bring prices under control. The provincial government has taken a series of administrative and economic measures in support of hog and vegetable production, set a limit for the overall price level and strictly controlled price hikes, put a limit to the upward swing of floating commodity prices, introduced a system under which prior approval must be obtained to raise the prices of decontrolled major commodities, established price ceilings for some capital goods and major nonstaple foodstuffs, started rationing commodities in great demand but short supply, tightened supervision and inspection of market prices by departments such as those regulating prices, industry and commerce.

The price situation in Anhui is still grim this year, but there are also favorable factors for stabilizing market prices. The central government has made it clear that in stabilizing the economy this year, attention should focus

on prices. This means that the stabilization of market prices is guaranteed by policy. The situation of industrial and agricultural production in Anhui was very good last year. A bumper grain harvest has been brought in. The provincial government has adopted a series of measures proven effective for promoting hog and vegetable production. Hog production has now begun to rise again throughout the province, and market pork supply is expected to improve in the latter half of the year. In order to improve guidance and control of prices of capital goods not covered by state plans and to prevent unjustifiable price increases and arbitrary charges, the State Council, in a circular issued on 11 January, set a unified nationwide price ceiling for these capital goods. At present, the excessive buying spree among urban and rural residents is subsiding gradually. At the same time, we must also see the unfavorable factors which will have an adverse effect on prices. This year, the proportion of capital goods to be procured outside of state plans will continue to grow; some imported commodities will be priced by agents; a surplus purchasing power has been building up in Anhui in the past few years; commodities directly controlled and priced by the state are rapidly diminishing; and industrial and commercial enterprises are demanding for price increases. All this will have a negative impact on prices. We must strive even harder to carry out the reforms, move forward steadily, and maintain basic stability of market prices.

First, we must adhere to the principle of "persisting in reforming the price system, making steady advances, and maintaining basic price stability" and continue to keep the overall price level from growing too fast. All localities and departments must keep the overall political and economic situation in mind and give top priority to price stability in stabilizing the economy. All trades and professions must take the interests of the whole into account, adopt an overall viewpoint, and firmly oppose unjustified price increases and arbitrary charges imposed by areas, enterprises, and organizations which have the monopoly of certain commodities or the power to impose charges. A responsibility system for price stability should be established.

Second, we must keep the national economy growing in a coordinated way, persist in developing a planned commodity economy, and achieve an overall balance. Price reform must proceed in coordination with reforms in related fields. We must advance steadily and guard against impetuosity and rashness.

Third, we must keep money supply within the limits of market tolerance. We must strictly control the scale of capital construction and the growth of consumption funds. When the scale of capital construction exceeds the endurance of the country's financial and material resources, it will invariably lead to shortages in energy and raw and semifinished materials, excessive growth in consumption funds, and ultimately soaring prices.

Fourth, we must strive to improve economic performance, promote production of agricultural and sideline products and manufactured goods for daily use which are in short supply, and increase supply of readily marketable commodities. Only in this way can we withdraw large amounts of currency from circulation, build up our financial reserves, and create conditions for increasing the wages of workers and office staff step by step. Without the needed material guarantee, wage increases will lead to a vicious economic cycle.

Fifth, we must strive to stabilize the prices of nonstaple food items in urban areas and the prices of the means of agricultural production. Production of ordinary vegetables for urban areas should be planned to insure growing areas, fulfilment of contracts, and supply to the market. The role of state commercial departments as the main channels should be brought into full play. Control over the prices of chemical fertilizers, insecticides, and other means of agricultural production must be tightened so that they will remain stable.

Sixth, we should step up price supervision and inspection. To support and tighten price inspection, we should combine inspection by professional inspectors with supervision and inspection by the masses. Price inspection should be focused on state enterprises, particularly the monopoly enterprises. In urban areas, the major inspection targets are vegetables, meats, eggs, and other nonstaple food items, manufactured goods for daily use in great demand but short supply, and important means of production. In rural areas, the major targets are chemical fertilizers and other means of agricultural production. Organizations and individuals who have increased prices without justification or charged fees arbitrarily on commodities must be dealt with firmly and punished severely according to law in order to maintain the basic stability of prices.

12802

INDUSTRY

National Chemical Production Increases

OW0705070188 Beijing XINHUA in English 1401 GMT 5 May 88

[Text] Beijing, May 5 (XINHUA)—The total output value of China's chemical industry hit 5.7 billion yuan (about 1.5 billion U.S. dollars) as of the end of April, up 11.1 percent over the same period last year.

According to the Chemical Industry Ministry, compared with the same 1987 period, the output of all major chemical products, except pesticides and paint whose output was restricted by raw material supplies, increased by varying degrees.

During the past four months, China produced 5.89 million tons of chemical fertilizers, an increase of 13.7 percent over the same period last year. Of this figure 4.69

million tons were nitrogen-based fertilizers, an increase of 11.2 percent, and 1.19 million tons were phosphate-based, or 25.1 percent more than the same period last year.

The minister warned factories not to neglect safety procedures while striving to increase production.

SMALL-SCALE ENTERPRISES

Auctioning Off Small Enterprises as Part of Reform

40060225 Beijing JINGJI CANKAO in Chinese 24 Feb 88 p 4

[Article by Li Guozhong [2621 0948 0022], Department of Finance: Improved Structural Organization, Effective Material and Resource Allocations: Auctions are One Way to Thoroughly Reform the Small Enterprises"]

[Text] As the restructuring of the economic system becomes more thorough, the country is now striving to enliven the large and medium-sized enterprises under the people's ownership system, and at the same time, reforms are being implemented among the state-owned small enterprises. The auctioning off of small enterprises in some pilot cities is one of the more note-worthy reform experiments. It may eventually speed up the reform of the ownership system in this country. The experiment serves as an important example, and may have significant historic implications.

In recent years, we have benefitted and learned from the successful separation of ownership and management in the villages. In the process of finding ways to separate the two powers, the cities have produced new reform ideas such as inter-enterprise contracting and enterprise leasing and other ways to sort out the production rights and relationships in the state-owned enterprises. These new concepts are the forerunners to the auctioning off of some small enterprises.

Auctions affect the thorough reform of small enterprises in many ways:

One, it will improve and modify industrial organization and enterprise structure.

China's industrial organization and enterprise structure have undergone many adjustments and reorganizations, but we have yet to perfect the industrial and enterprise systems. Poor industrial organization and a one-dimensional enterprise structure, coupled with rigid separatism, have deprived enterprises of the benefits of economies of scale and society of the benefits of better macroeconomic performance. Auctioning off some of the small enterprises in a planned and systematic way will allow the better-run large and medium-sized enterprises (and some small enterprises) to expand independently to achieve greater economies of scale, and at the same time, some small enterprises which are losing money, or are making little profit, may be able to buy time, and have more room to grow and survive, rather than risk bankruptcy. This unquestionably has positive effects on gradually improving China's industrial organization and enterprise structure.

Two, the flow of state-owned assets and the allocation of materials and resources will become more smooth and effective.

One of the defects in the traditional management of state-owned assets is, on the one hand, it does not allow enterprises to make better use of idle funds independently, and it prevents the state-owned assets from circulating more smoothly and being distributed more efficiently. As a result, many state-owned assets are idled and forgotten, or have lost their usefulness. On the other hand, the government has always tried to "prolong the life" of those state-owned enterprises which are perennially losing money by investing more money in them. This has become a heavy burden on the government, and has slowed the nation's economic growth. Auctioning off some of the small enterprises systematically will give full play to the huge stock of state-owned assets, and it can also put a stop to the ever-increasing investment expenses. This no doubt will facilitate the highly efficient circulation of state-owned capital, and increase the effective use of all of society's materials and resources.

Three, it will toughen the present control mechanism over state-owned assets, and improve the way enterprises operate and the way they use their funds, and in time, enliven the socialist economy.

Four, auctioning off the small enterprises will lead to more competition, and benefit the construction and perfection of the socialist commodity market and market for essential goods.

We should realize that there are still many problems in our experiment with the auctions. For example, there is no unified and effective control over the auctions and the auction market, and we still have to device some measures to deal with the displaced workers. There is no practical "cure" yet for the entrenched rigid separatism in the financial system, and traditional concepts are still a formidable obstacle. During this early stage of socialism in China, we still lack experience in handling these auctions, and it is inevitable that some technical errors are being made, but things can be worked out and normalized gradually as the reforms become more thorough, and as new ideas accumulate, and as the legal system, economic measures, and other administrative policies continue to improve.

12986

Science, Technology Seen Key to Township Production

OW2904233688 Beijing XINHUA in English 1339 GMT 28 Apr 88

[Text] Beijing, April 28 (XINHUA)—If township enterprises want to survive in the future they must resort to science and technology to revitalize their production, said today's "ECONOMIC DAILY".

These enterprises previously enjoyed advantages such as flexibility in management and cheap labor costs. Now, however, they are being challenged by large, state-owned enterprises which are starting to benefit from more and more managerial autonomy granted to them by the state.

Township enterprises have no way out but to make good use of technological know-how to boost production.

This is possible since the government is encouraging technological transfers and organizing scientific workers and technicians to work in township enterprises, the paper said.

56 Percent of total industrial output in the city of Wuxi, in Jiangsu Province, comes from 12,000 township enterprises, and fully a third of that has been attributed to technological improvements, said the paper.

One of the city's township enterprises concentrating on the production of magnetic material has only 60 workers and staff members, but it has hired 12 engineers, including three senior ones. One new product which they helped developed, alone raised the company's output value by three million yuan and a 20 percent increase in profit rate.

Anhui Encourages Scientists To Run Rural Enterprises

OW0405044388 Hefei Anhui Provincial Service in Mandarin 1000 GMT 2 May 88

[Excerpt] The provincial government recently issued suggestions to encourage scientists and technicians in management positions of units directly under the province to support village and town enterprises. The suggestions were aimed at urging and encouraging these managerial scientists and technicians to run, or set up, such rural enterprises by contract. They can do so by requesting for transfer, resigning or taking leave without pay from their present positions.

The suggestions say: In the case of those units supporting poor areas or assisting rural enterprises of their same specialties and for which the preferential policy of compensations applies, income tax will be exempted if their incomes so earned are below 300,000 yuan, and at a 50 percent rate for the portion in excess of the amount. Forty percent of their incomes should be awarded to their personnel on outside assignment to carry out support work, 30 percent as bonuses to those remaining at their original posts, and 30 percent retained as unit funds. Personnel on outside assignment should enjoy the same benefits as those remaining at their posts. The salary, bonuses, allowance, subsidies, and other benefits they were originally entitled to will all remain as before the outside assignments. Neither will they be excluded from job promotions or salary increases, which will be considered on the same basis as their other colleagues. Personnel on such outside assignments, who are expected to spend more than 1 year in the countryside doing support work, will get a one-grade wage increase, starting from the second month of their transfer to the countryside. After having consecutively spent 3 years in support work, not only will the wage increase become part of his fixed salary, but he will be given still another grade increase. The same wage increases will be given every 3 years. During the period of their assignment in the countryside, in addition to the Finance Ministry prescribed rate of subsidy of 1.5 yuan a day, each person will be given another 30 yuan a month by the units receiving their support as countryside-assignment subsidy.

The suggestions provide that all units, as well as responsible departments, support the wish of their managerial scientists and technicians who volunteer to work in the rural enterprises located within the province. Units and responsible departments should also take the initiative in contacting the counties where the rural enterprises to which their managerial scientists and technicians wish to be transferred are located, in order to facilitate their direct transfer. When the scientists and technicians of an office, higher institution of education, scientific research unit, or large or medium-sized enterprise having a relative surplus of talented personnel, or where the scientists and technicians, finding little use for their specialties, request to resign or for leave without pay so that they can go to work for the rural enterprises in the province, their units and the responsible departments should give permission for them to be transferred. By acting in accordance with the relevant regulations, they should complete the examination and approval procedures without delay for those who have requested to resign and then issue them a certificate of approval for their resignation, plus resignation subsidy.

FOREIGN TRADE, INVESTMENT

French Companies To Develop Guangzhou's Ershatou Island

35190052 Paris L'USINE NOUVELLE in French 10 Mar 88 p 44

[Article by Daniele Guiheneuf-Bouvron: "An Island Between Lyon and Guangzhou"]

[Text] Lyon companies entered into a partnership to win the contract for the development of an island in the Chinese metropolis. This is an example of cooperation with markets a benefit realized in the bargain.

That the Lyon companies recently won a contract to develop an island in Guangzhou and a new district in Shanghai is quite a success. The contracts come to 1.6 billion francs, and when considering secondary markets, they amount to between 11 and 13 billion francs. Needless to say there will be extensive spin-offs for French and European companies. A large share of this achievement is due to the "spark" created by the Rhone-Alpes Codevelopment Association (ACODERA) and by a second meeting between two friends: Pierre Crozat, an urban architect and ACODERA secretary general, and Phuc Sinh Hoang, a French urban architect of Chinese origin. The latter, well-received in Guangzhou, was devising development plans there but did not have the organization to implement them. ACODERA, headed by Paul Minagoy, brought together building and transportation professionals and urban developers for the purpose of implementing projects abroad and was ready for this type of operation.

The Lyon companies are going to develop the Ershatou Island, on the Pearl River. Guangzhou's goal is to turn the island into a district with international standards by taking advantage of its vicinity to Hong Kong. There, hotels, offices, convention centers, sports and cultural complexes will be mixed with over 3,000 apartments and houses for both a foreign and Cantonese clientele.

It will be a vast project implemented through a French-Chinese joint venture, cosigned by SERL (Engineering Company for the Lyon Region). The construction quality desired demands that much outside know-how and imported materials be used, even if local, Chinese skilled workers are employed, particularly for the infrastructure. Consequently, there will be many opportunities for the companies from prefabricated elements for interior decoration to construction machinery, coatings, floor coverings, air conditioning, elevators and security systems, including, in the matter of services, engineering, operation and maintenance.

Is the Lyon "contract," like many others, liable to remain on paper for lack of financing? "Certainly not," maintains Ludovic Grangeon, an official of SERL Development. "First, the contract includes few Chinese payments and the largest share depends on a banking pool made up of European banks and international investors of the Asian Southeast. Second, a setoff settlement is possible. Finally, the project will not begin without premarketing which is looks promising."

After such promising beginnings in China, the Lyon companies left "their island" to propose their services farther afield. The Metro Engineering Company for Greater Lyon (SEMALY) won the contract for the Guangzhou metro (two lines, 20 kilometers, some 20 stations) for which it is preparing the feasibility study: "Our Lyon metro solved problems similar to those present in Guangzhou. This helped convince the Cantonese," noted Jean-Louis Debauge of SEMALY.

As for the Merlin Agency, it won the feasibility study for a household waste management plant. "It will be the first one to be set up in Guangzhou," specified Technical Director Bernard Capon.

It does not end there. After Guangzhou comes Shanghai. There, in three stages, the Lyon companies will build a new district, Guobei (156 hectares; floor surface: 2,200,000 square meters; 1 billion francs in installations and between 8 and 10 billion francs in secondary markets for all three stages; the same French partners as in Ershatou).

These technical and economic ties have paved the way for cultural ones: Lyon and Guangzhou became sister cities in January. Villeurbanne in turn is getting ready to become a twin of Nanning (in the Guangxi Zhuang Automonous Region). On the banks of the Rhone, China is now part of the family.

6857

AGRICULTURE

Potatoes to USSR

OW1451818 Beijing in Russian to the USSR 1800 GMT 13 May 88

[Summary] As of May 7, 5,000 metric tons of potatoes were exported to the USSR from Nenjiang Plains, Heilongjiang; another 10,000 metric tons will be exported shortly. Total potato export amounted to 2,640,000 Swiss francs, or 7,128,000 yuan. Nenjiang Plains in the Heilongjiang Province is the leading production base of potatoes in China. A contract on supply of 15,000 metric tons of potatoes was concluded last year between the Heilongjiang Province General Foreign Trade Company and the USSR Far East Main Foreign Trade Organization. The exported potatoes will be bartered for chemical fertilizers, soda ash, lumber, and steel.

More Investment in Agriculture Urged

OW1305030688 Beijing XINHUA in English 0619 GMT 12 May 88

[Text] Beijing, May 12 (XINHUA) — China's agricultural sector may slow the country's economic development in coming decades unless the state makes more material and intellectual investment in the sector, today's "GUANGMING DAILY" reported.

According to the paper, before 1980, the state allocated 11 percent of its funds annually to capital construction for agriculture, but now the figure is only 3.5 percent.

Because of less investment in irrigation systems, the amount of land being irrigated has decreased 1.5 million hectares. The country will have to produce another 20 million tons of chemical fertilizer annually to meet farmers' demands.

The article suggested the state increase investment in the farming industry so more land can be put under irrigation and also proposes fertilizer production be increased to 130 million tons by the end of the century.

The state should also try to check up on the use of arable land for nonfarming projects and to reclaim another 1.4 million hectares of wasteland by the year 2000.

The Government should also work out policies which would raise farmers' incomes in China's major grain-producing areas like the lower reaches of the Yangtze River, the northeast plain, and the Yellow and Huihe river plains.

The article also said, the state should increase funds spent on agricultural educational programs and related projects by at least 50 percent annually, because without technology, China's agriculture will not see sound development in the future.

Spark Plan in Tibet

Lhasa Tibet Regional Service in Mandarin
1330 GMT 22 May 88 HK

[Summary] Tibet Region has implemented the spark plan for only 2 years but has scored achievements in some projects, thus further developing the economy of the agricultural and pastoral areas. As of the present time, 28 projects have been carried out and the total investment has been 3,055,000 yuan. With the implementation of the spark plan, the agricultural and pastoral areas have now trained some 500 technicians of various kinds.

Farm Loans

40060268a Beijing NONGMIN RIBAO in Chinese
21 Apr 88 p 1

[Excerpt] From January to March, agricultural banks and credit cooperatives throughout China provided 32.2 billion yuan in loans for spring planting, an increase of 4.4 billion yuan over the same period in 1987.

Agricultural Investment Increases

40060268d Beijing JINGJI RIBAO in Chinese
25 Apr 88 p 1

[Excerpt] In the first quarter of 1988, farmland capital construction and agricultural investment increased, more than 58 million mu of irrigated area was added, transformed and recovered. In the first quarter, agricultural banks and credit cooperatives provided 23.9 billion yuan in loans, an increase of 1.5 billion yuan over the same period in 1987. Peasants spent 18 billion yuan on farm production materials, an 18 percent increase over the same period in 1987, but supplies of pesticides and plastic sheeting for farm use declined. The area sown to summer grain has increased by more than 5 million mu over 1987.

Fertilizer Output

40060268c Beijing JINGJI RIBAO in Chinese
24 Apr 88 p 1

[Excerpt] Output of chemical fertilizer in the first quarter of 1988 was 21,360,000 tons, a 15 percent increase over the same period in 1987, and accounted for 26.3 of the annual plan. Imports have increased, but supply does not meet demand.

Pig Output Increases

40060268b Beijing JINGJI RIBAO in Chinese
7 May 88 p 1

[Excerpt] According to a survey of 20 provinces, municipalities, and autonomous regions, at the end of February, there were 236,160,000 pigs in stock, a 4.8 percent decrease from the same period in 1987, but a 2.5 percent increase over the last survey (end of November 1987). Sows accounted for 7.1 percent of stock.

Anhui Peasant Income

40060260e Hefei ANHUI RIBAO in Chinese
19 Apr 88 p 1

[Excerpt] According to a survey of 3,100 rural households in Anhui Province, in the first quarter of 1988 peasant per capita cash income (excluding income from savings and loans) was 103.6 yuan, an increase of 26.0 yuan over the same period in 1987, or 33.5 percent. Deducting price increases, the actual increase was 21.8 percent. The major reason for the increase was that prices for agricultural and sideline products rose. In the first quarter of 1988, on average peasants earned 57.8 yuan from sales of farm and sideline products, an increase of 15.9 yuan, or 37.9 percent, over the same period in 1987, and accounted for 61.1 percent of income earned. In the first quarter, peasant income earned from secondary and tertiary industry was 22.5 yuan, a 29.8 percent over the same period in 1987, and accounted for 21.8 percent of income earned, a 0.6 percent decrease from 1987.

Recoverable Remote Sensing Satellite

40050091 Beijing DANGDAI ZHONGGUO DE HANGTIAN SHIYE [CONTEMPORARY CHINESE SPACEFLIGHT] in Chinese Jun 86 pp 289-320

[Text] If an entire spacecraft or a portion of it returns to earth after completion of the mission, it is termed a recoverable spacecraft. This includes recoverable earth satellites, survey and sampling spacecraft sent to the moon or planets, manned spaceships, and space shuttles. Recoverable spacecraft have an important role in astronautical technology and constitute a considerable portion of all spacecraft launched.

Based on different effective payloads, missions and purposes, recoverable satellites can be divided into many types. In the development of all recoverable satellites, the re-entry technique must be resolved to return the satellite safely to earth from its orbit. To this end, in addition to solving technical problems associated with all satellites, these technical difficulties must be overcome.

Attitude Control. The attitude of the satellite has to be accurately adjusted for re-entry prior to its return to earth and the satellite must remain stable.

Braking Control. The retro-rocket on the satellite has to produce the necessary thrust to push the satellite away from the original orbit and enter a pre-determined re-entry orbit. To this end, it is required that the retro-rocket should be fired on time and operate reliably and normally to ensure that the returning capsule enters the pre-determined orbit after the retro-rocket stops.

Heat Resistance. We not only must insure that the rapid re-entry process does not burn up the satellite due to intense friction against the atmosphere, but also must maintain the cabin temperature at below the maximum operating temperature of the instruments.

Soft Landing. This requires the development of a reliable parachute system and a recovery control system to allow the satellite to land at a very low speed after slowing it down by parachute. Thus, the recovered object remains in tact.

Search and Marking Location. This is to make sure that the location of the landing point can be forecast and measured accurately in real-time so that the crew can quickly find the landed vehicle and proceed to recover it.

China's first type of recoverable spacecraft was the remote sensing satellite. From 1970 to 1985, China launched 17 satellites into orbit and 7 of them were recoverable. China finished the experimental stage of the development of recoverable satellites with the successfully launch of three such satellites in the 1970's. Since the beginning of the 1980's, recoverable satellites have entered an application stage. A great deal of telemetry data has been obtained by these seven satellites. In addition to research in science and technology, the information is used in the construction of China's national economy with very good socioeconomic benefits.

Section 1. Experimental Recoverable Satellite

The development of recoverable satellites went through four stages. From early 1966 to September 1967 was the proof of concept stage. From September 1967 to March 1970 was the plan design stage. From march 1970 to January 1973 was the prototype development stage. The final development stage began in January 1971.

The entire development program was led first by Wang Xiji [3769 1585 1323] and then by Sun Jiadong [1327 1367 2767] as directors of the Space Technology Research Academy.

1. Determination of the Final Overall Plan

Based on the fact that the Central Special Committee approved the "Recommendations Regarding the Plan for the Development of Satellites in China" from the Chinese Academy of Sciences, since the beginning of 1966, the 8th Design Institute of the Seventh Machine Building Ministry started to investigate the overall plan for a recoverable satellite under the direction of Chief Engineer Wang Xiping. By the end of the year, a design was conceptualized. In addition, the design of some on-board systems (such as the camera system and attitude control system) was studied. From March to September 1967, despite the fact that the development team members, especially some key technical people, were severely impacted by the political chaos then, the proof of concept was finished as scheduled due to the professionalism demonstrated by the team and the cooperation given by all units involved. A report was written on China's plan to develop a recoverable satellite. On the basis of a relatively extensive study, this report correctly handled the relation between what is advanced and what is feasible by seriously considering China's technology level and by referring to the recoverable satellites developed by other countries. Therefore, although this plan was repeatedly perfected at various stages, the overall structure was not changed.

The recoverable satellite carried a visible light surface feature camera to take photographs in pre-determined areas in China from its orbit. In addition, a stellar camera was simultaneously used to photograph space in order to correct any attitude error of the satellite later. After the pre-determined mission was finished, the film magazine was recovered to obtain the remote sensing data.

The satellite weighed approximately 1,800 kg. Its orbit was a near earth orbit with a large angle of inclination. Its typical orbit parameters are (based on the actual

initial orbit parameters of the recoverable satellite launched in 1967): perigee 173 km, apogee 493 km, period 91 minutes, and angle of inclination 59.5 degrees.

The satellite consisted of 11 systems, including the structural, temperature control, photography, attitude control, program control, remote sensing, remote control, tracking, re-entry, antenna, and power supply systems. It is divided into an instrument cabin and a re-entry cabin.

The instrument cabin consists of its own structure, the surface feature camera, stellar camera, satellite attitude control system, program control system and tracking system.

The re-entry cabin consists of its structure, the equipment for spinning up and despinning the cabin, retrorocket, recovery system, tracking and remote sensing devices, and film magazine.

The re-entry process can be briefly described as below. In order to allow the retrorocket to work in the predetermined thrust direction, the attitude of the satellite is adjusted first. It is turned from the head first position to the rear forward position (turning angle 100 degrees), then the re-entry cabin is separated from the instrument cabin. The spin engine is used to rotate the re-entry cabin along its longitudinal axis to stabilize the attitude of the re-entry cabin. The retrorocket is then fired to bring the re-entry cabin from the satellite orbit to an earthbound trajectory. Prior to entering the atmosphere, the spin down engine is activated to slow down the spinning of the re-entry cabin in order to allow it to turn back to the head first position quickly after re-entering the atmosphere. Approximately 16km from the ground, the retrorocket and the bottom heat shield are discarded. The four parachutes in the re-entry cabin are opened in order. The re-entry cabin, together with its main parachute, lands safely traveling 14 meters per second.

There are many technical difficulties to recover a satellite smoothly at a pre-determined time and place. For example, if the velocity at the point of re-entry deviates by one degree, the point of landing will be off by 300km. The remote control and the on-board control program must be flawless, otherwise, the satellite will fall outside the recovery area.

In order to carefully design the re-entry path, engineers must optimize the re-entry braking angle (i.e. the angle between the direction of thrust of the retrorocket and the horizon). The optimal braking angle results in the shortest re-entry path and the smallest amount of dispersal of the landing point. The purpose of spinning the re-entry cabin is to stabilize the attitude before the braking rocket begins to work. Landing point dispersal is directly related to the rate of rotation. They rigorously studied the relation of the rate of rotation with the drag resistance of the re-entry vehicle and the energy of the spin engine, and chose 100 revolutions per minutes as the rate of rotation for the re-entry vehicle.

The selection of the recovery area involves many complicated technical problems. The United States generally recovers this type of satellite on the sea. Based on China's situation, it was decided to recover it deep inside China after repeated comparison of several plans. An area in southern Sichuan was chosen as the satellite recovery zone. The advantage is that the satellite flies over China in its last revolution around the earth so that its orbit can be measured. The equipment in the Jiuquan launch site can be used to determine its orbit. Based on this scheme, it is only necessary to set up monitoring stations in China to accomplish the control of satellite re-entry.

The re-entry vehicle has a spherical head, conical middle section and spherical bottom. In order to ensure that the re-entry cabin can gradually turn to a head first position after re-entering the atmosphere, the re-entry vehicle is required to have sufficient frontal static stability. To this end, the spacecraft design department and the Aerodynamic Research Institute worked together. Through a great deal of analyses and supersonic and hypersonic testing of several models, a profile that met design requirements was selected. This profile was then tested many times in a wind tunnel. These experiments provided a basis for obtaining the correct aerodynamic and surface pressure coefficients for the re-entry vehicle.

2. Subsystems

(1) Space Photography System

The space photography system includes a surface feature camera and a stellar camera. It plays a major role in a recoverable satellite. The quality of the design of the photography system has a direct impact on the quality of the photographs.

From spring 1966 to October 1967, the Changchun Institute of Precision Optical Instrumentation of the Chinese Academy of Sciences was responsible for the verification of various schemes. Although the technical staff responsible for the development of the surface feature camera had experience in cameras for aerial photography, yet they never touched any astronautical camera before. They reviewed a large number of foreign literature, analyzed all the aerial cameras available in China and presented a design concept for the ground feature camera. The stellar camera is used to take pictures of the stars in order to fix the position of the ground camera. The development of a stellar camera was a brand new subject. When Wang Jintang [3769 6855 1016] et al accepted the assignment, they had no idea about the basic parameters for the stellar camera such as exposure time, f stop etc. They found the answers from trial and error in simulations. For example, the exposure

time went from 1/100, 1/50, to 1/20 of a second and they still could not see the stars in the picture because the stellar light is too weak. Finally, the exposure time was set at 0.5 second to see the stars. In May 1967, Changchun Institute of Precision Optical Instrumentation and the Institute of Chemistry of the Chinese Academy of Sciences conducted a simulation experiment at the Shahe Observatory in Beijing to obtain the angular velocity of the orbiting satellite relative to the sky. This had a important effect on the selection of the scheme of the stellar camera.

Due to political chaos, the camera development work could no longer continue in Changchun. A number of people were selected from the Changchun Institute of Precision Optical Instrumentation, Factory 811 of the Ministry of Public Safety and Beijing Industrial College to form an engineering group in Beijing (later known as the Camera Engineering Section) to conduct the development work. The people from Changchun had to overcome family problems to come to Beijing by themselves to work on the development project. Under the direction of experts such as Wang Daheng [3769 1129 3801], the team worked very hard and presented a system plan in January 1968.

In February 1968, the Camera Engineering Section began prototype design and production of the photography system. In spring 1969, it was discovered that the film storage mechanism in the ground camera jammed and the film delivery system became backed up easily; the air seal of the lens cylinder did not meet requirements; certain connectors loosened up upon vibration; the recoverable film cannister could not stand up to the internal pressure and the thin wall became severely distorted; in addition, the seal and closing mechanism did not meet requirements. These problems were gradually solved by improved designs. The film magazine development work was transferred to the Beijing Design Institute of Electrical Machinery in March 1970. The development proposed a new design which combined the wall of the magazine and the support for the film. This design is compact and lightweight. In the development process, the machinists overcame the lack of equipment and manually made the cannister. They used a planer to roll out the protrusion on the cannister and used a manual milling machine to mill the complicated sealing groove with high precision requirements (no digital milling machine was available back then). The experimental part passed the preliminary seal test. In the prototype design stage, the processing technique was improved and a great deal of environmental tests were done. The film magazine developed by the institute completely met the design requirements in all test flights. The cannister was immersed under 7.5 meters of water for 7 days and nights. Its integrity and seal remained intact which kept the film untouched.

In October 1969, the surface feature camera was tested on an aircraft. The film used was developed and manufactured by the Baoding Film Factory. Very satisfactory ground pictures were obtained.

Beginning in June 1970, the prototype camera was tested on the ground and all problems were resolved by improved design. In October 1974, the photography system for a recoverable satellite was manufactured.

(2) Attitude Control System

The attitude control system of a recoverable satellite serves three purposes. First, it eliminates interference to the initial attitude of the orbiting satellite due to the separation of the satellite from the rocket. Second, it carries out tri-axial attitude control in the orbiting stage to aim the ground camera at the region of interest. Third, it adjusts the longitudinal axis of the satellite to the re-entry position so that the retrorocket thrust direction meets design requirements.

The attitude control system was developed by the Beijing Institute of Control Engineering. In 1967 Zhang Guofu [1728 0948 1381] proposed the concept of the re-entry attitude control system and began to lead the proof of concept and technical design effort. Based on realistic conditions, they chose an active tri-axial attitude control scheme for reliability. This was the first time that such a system was ever used on a Chinese satellite. In order to be able to adjust the pitch of the satellite over a wide range prior to re-entry and to measure the yawing, through investigation and verification it was decided to install a mechanism on the horizontal gyroscope which rotated at a constant speed. Upon receipt of an attitude adjustment command, the signal from the infrared horizon sensor was interrupted, freeing the horizontal gyroscope and activating the programmed mechanism. Thus, as long as the control design was reasonable, it was possible to meet pitch adjustment requirements prior to re-entry. As for measuring yaw, after repeated testing by experts in automatic control such as Yang Jiachi [2799 0857 1062], it was decided to use an orbit gyrocompass, a device quite advanced for that time.

The conical scanning infrared horizon sensor is the key instrument in attitude determination. This technology was not available in China. The Shanghai Institute of Applied Physics developed the prototype in the summer of 1969. In June and July 1969, two high altitude tests were done on this infrared horizon sensor at Jiuquan using modified "T-7A" weather rockets as launch vehicles. Very valuable data was obtained which served as the basis for further improvement of the design.

In 1970, under the direction of Yang Jiachi, the prototype attitude control system was tested in three-large scale simulation tests. A tri-axial mechanical rotating platform was used to conduct a semi-physical simulation. A uni-axial pneumatic platform and a tri-axial pneumatic platform were used to perform full physical simulations. The reliability and accuracy of the system were demonstrated by these large-scale experiments and certain system parameters were also determined. In the

scheme, advanced techniques as automatic gain adjustment and optimization of parameters were adopted to meet technical standards of the 1970s.

Among all systems on the satellite, the attitude control system took the lead in analyzing and evaluating the reliability of the parts, components, and total system. It was the first to have a system to regulate the selection and quality control of all elements, which had a very favorable impact on the quality of the product.

(3) Temperature Control System

The complex structure, unique heat distribution, and absence of a cowl made it difficult to design a temperature control system for a re-entry satellite. The Spacecraft Overall Design Department, under the direction of Min Guirong [7306 2710 2837], finished the design of the temperature control system. For the first time, thermal reduction modeling and heat pipe techniques were applied in China.

Thermal reduction modeling involves the construction of a small satellite model and testing the model in thermal vacuum. The test results could be converted to data relevant to the satellite. The major problem was to meet the criteria for similarity. Beginning in 1969, after repeated testing over several years, technical problems associated with the modeling of passive temperature control of a stable satellite were fundamentally solved. The size of the model was reduced to a fraction of the satellite. A comparison of the results obtained with the model and the real satellite showed a temperature variation within 5 degrees Celsius.

Min Guirong saw a brief introduction of heat pipe in a foreign journal in 1966. He thought this new technology is a good way to control temperature and proposed to use it on a satellite.

Heat pipe is a new way to control temperature. The research began in 1969. It was used in a Chinese re-entry satellite in 1976 with satisfactorily results.

In addition, in order to ensure that the recoverable capsule does not dissipate too much heat while in orbit and the film magazine temperature remains below 50 degrees Celsius during re-entry, insulation consisting of several layers of aluminum film was added to the inside of the fiberglass nose and were supported by a lightweight non-metallic material. In other countries, a very expensive synthetic polymer—polysulphone—is used. In 1970, the temperature control designers conducted a great deal of experiments with a large number of materials for analysis and comparison. Finally, an ideal new material was chosen with significant reduction in cost and weight. It performed well in satellite flight tests.

(4) Re-entry Capsule Structure

In the design of the re-entry capsule, in addition to the environment in the launch and orbiting stage, we must also consider the high heat (surface temperature 1000-2000 degrees Celsius), high pressure and braking overload environment in the re-entry process. With a given weight, the design people were facing difficult challenges to ensure that the capsule does not get destroyed by the intense heat generated by aerodynamic acceleration and how to maintain capsule temperature so it does not exceed the maximum operating temperature of the instruments. In the fall of 1967, this assignment was given to a number of young technical staff members who never had any experience in heat resistant structures. They proceeded knowing the difficulties involved. After an investigation, with assistance from relevant organizations, they came up with a preliminary plan. Based on the characteristics of the thermal environment in each section of the re-entry capsule, different heat-proof schemes were used.

The spherical nose is most seriously affected by heat. Upon re-entry, the maximum heat flux could reach 600 kcal/m2.sec. It is most appropriate to use an ablative insulation scheme. If a high melting point ablative material is used, the structure would be very heavy. This was the approach used by other countries in the late 1950s. Nevertheless, it was unlikely for China to make an immediate breakthrough in low temperature carbide materials which were developed since the mid-1960s. Therefore, a decision was made to rely on relatively mature shape-molding technology to search for a carbide material suited for satellite use. To this end, a lot of material screening tests were done. Through the analysis of the ablative mechanism, comparison of physicochemical properties, and explorations in molding technique, a composite material was preliminarily chosen as the heat shield for the nose of the re-entry capsule.

The first batch of prototypes were tested in the KM-3 thermal vacuum simulator at the Institute of Space Environmental Engineering in August 1971. When the ambient temperature reached below -40 Celsius, the heat shield fractured. An analysis showed that the major cause was the drastic difference between the linear expansion coefficient of the heat resistant material and that of the metal substrate. It could not withstand the low temperature environment. In the selection of this material, more emphasis was focused on its ablative characteristics while its physical and mechanical properties were neglected.

The development group at the spacecraft design department learned from this failure. They were forced to search for a material with good heat resistance and better thermal compatibility. Through the hard work of the Institute of Materials Technology, a new composite material "XF" was found. It was demonstrated experimentally that its effective thermal capacity is significantly higher than those of high melting point ablative materials. Furthermore, the surface carbon is strong which makes it more resistant to aerodynamic shear

force. After heat treatment, its linear expansion coefficient is slightly lower than that of aluminum-magnesium alloy. Spherical nose structures using "XF" as the heat shield smoothly passed the thermal vacuum test from 120 to -100 degrees Celsius. In all flight mission, the satellites safely returned to earth.

A radiation scheme was chosen to provide heat protection to the skirt of the re-entry vehicle. A molybdenum alloy was preliminarily selected as the skin material. After analyzing the first return in 1975, this scheme was considered unfeasible because it did not consider the increase of local heat flux due to the protrusion at the skirt.

The heat flux at the bottom heat shield is relatively small and the equilibrium surface radiation temperature is not very high. In this case, although the radiation scheme may be used, however, it is economically wasteful weightwise and complicated in structure in view of the fact that the heat flux on the bottom heat shield rapidly decreases as the nose is gradually turned forward. The duration in which the radiation scheme works effectively is very short. Finally, it was decided to use a heat resistant erosion coating with an internal high temperature insulation structure at the bottom. Various heat resistant erosion materials were screened. A large number of heat resistant organic coatings were discarded because they could not withstand the high vacuum and ultraviolet radiation. Finally a new silicone rubber was developed which smoothly passed various environmental tests for space.

On November 1975, the first Chinese recoverable satellite returned from space. Although the heat shield protected major items to be recovered for the first time in history, the molybdenum structure in the skirt section was damaged by heat. The technical staff responsible for the design of the heat resistance system received the news with a sinking heart. According to their analysis, the cause is the aggressive heat environment near the local protrusion. In addition, the external flow condition varies too much for a uncontrolled re-entry vehicle. The radiation scheme is not appropriate for this application. To this end, they decisively switched to using the "XF" composite material as the heat resistant material for the stabilizing skirt. Although the weight increased somewhat, reliability improved. When the satellite returned for the second time on 10 December 1976, the skirt was undamaged.

The structure of the recoverable satellite is very complicated. Not only a considerable amount of ablative materials, high temperature sealants and heat resistant alloys and titanium alloys were used, but also a lot of integral walls, integral thin wall cast items and curved machined parts were used. The precision requirements are very high and the processing is very difficult. In terms of material and structure, many parts could not be made in China. Hence, special techniques would have to be developed.

Under the leadership of Director Sun Liyan [1327 4539 6056], the Satellite Assembly Plant overcame four major technical problem in the production of the recoverable satellite.

First is the casting of integral, thin wall magnesium alloy beam. The beam makes up the frame to mount the instruments on in the re-entry capsule. It is also a load bearing part which must withstand relatively large impact and overload. Therefore, we used the integral cast approach. Because of its thin wall, complex shape and high precision requirement, many experimental parts did not meet design requirements. Later, under the direction of casting expert Hu Zhong [5170 1813] from the Third Machine Building Ministry, the Satellite Assembly Plant finally was able to cast the beam to meet the needs. It laid a good foundation for casting thin magnesium alloy parts in the future.

Second is the forming and processing of titanium alloy frames. The Satellite Assembly Plant successfully applied this technique in the machining of titanium alloy used in the recoverable satellite.

Third is the fabrication of the door for the sealed capsule. The sealed capsule (instrument capsule) door is a curved part. At the rounded corner it is a hyperboloid. Given the situation that there was no five-axis digital control equipment in China, this type of complicated part was first converted to flat pieces by calculation and then pressed in a mold followed by heat treatment. This was a breakthrough in processing technique which provided a new approach to making similar parts for satellite use.

Fourth is the fabrication of a complex curved honeycomb structure. The door cover of the instrument capsule is a large conical honeycomb plate. In early 1969, Beijing Design Institute of Electrical Machinery was assigned to develop this part. Because a thermal press was not available, it was produced by applying mechanical pressure to a cast mold. Although the experimental part passed the strength test, however, the quality of the bonding was very poor. There many unbonded spots and areas. Furthermore, there are localized bulges. Later, a welded aluminum plate mold was used to perform the bonding in a thermal press. In addition, the bonding agent formulation was adjusted to produce qualified product which smoothly passed ground and flight tests. This is the first time in history that a sandwiched honeycomb structure was ever used in a Chinese satellite.

(5) Retrorocket Engine

The function of the retrorocket engine is to provide the re-entry capsule with certain acceleration in a pre-determined direction to push it out of its original orbit and to shift into return orbit. The development of the retrorocket was assigned to the Institute of Solid Rocket Engines in the Seventh Machine Building Ministry. It

has a spherical combustion chamber, star grain, recessed nozzle and ignition ring in the tail. This was the first time that such an engine was ever developed in China. From March 1968 to May 1971, most of the technical problems were resolved after numerous ground tests.

In August 1971, new technical specification was given to the retrorocket which required a reduction in weight and a decrease in thrust deviation. Based on the new requirements, plan verification and design modification were made in the fourth quarter of 1971. A higher energy propellant was selected and the grain parameters were varied correspondingly. From August 1971 to the end of 1974, the first solid rocket engine for satellite use was successfully developed in China after conducting many comprehensive tests on the ground. It was repeatedly tested in many flight missions.

(6) Satellite Recovery System

The function of the satellite recovery system is to ensure that the satellite lands safely at a certain speed. It includes the transmission of a beacon signal to allow it to be spotted as quickly as possible, and to open the parachutes to reduce speed. This is the final key step in the entire mission. If the recovery system fails, the entire effort is wasted.

The recovery system was developed by the Design Institute of Electrical Machinery. In designing the parachute, the major difficulty was strength. Due to lack of experience in designing parachutes for spacecraft, two full-size models were destroyed in the first air-drop test in July 1970. The structure of the parachute was reinforced. However, the second air-drop test in October still failed. They found the cause of the failure and took measures to reduce the impact load on the parachute upon opening. It was found to be successful in the air-drop test at the end of 1970 and the parachute scheme was nailed down.

A radio beacon was the primary means to send a signal for recovery. The satellite was equipped with a radio beacon. During re-entry, it transmitted ultra-short and medium band beacon signals for the ground crew to pin down its location. The ground tracking equipment includes medium band directional devices, mobile directional instruments and an ultra-short band directional gyro mounted on a helicopter. During the descent, the airborne directional gyro and ground directional vehicle are the primary means. After landing, the medium band directional device plays the major role.

In order to withstand high temperature and impact on landing, and to be able to continue to operate after landing, a scheme involving the use of a high temperature resistant antenna and a telescopic antenna was adopted by the Xian Institute of Radio Technology which was responsible for the development of the antenna for the recovery system. After repeatedly testing over a dozen temperature resistant composite materials, a niobium-based composite was found to be satisfactory. The plan for the antenna was then set.

Before early 1974, the key technical problem was still the parachute. With the enthusiastic support of the Chinese Air Force, several dozen air-drop experiments were carried out from low to high altitude beginning in late 1973. The recovery system, particularly the parachute, was thoroughly tested under various possible operating conditions in the re-entry process, including limiting cases. The design was improved and perfected along the way. By early 1974, the system was ready for use.

The drogue chute was initially ejected by a spring, which had been used for exploration rockets. Because the recoverable capsule has a large wake area and the energy of the spring is limited, in an air-drop test in January 1971 the drogue stayed in its jacket and could not be ejected. Consequently, the main chute did not open and the model was destroyed. A chute ejection device was developed to open a tandem configuratin main drogue and auxiliary drogue to ensure the opening of the drogue chutes.

As for the deceleration chute and main chute, the pack was opened and then the suspension lines were pulled taut, just like in a personnel parachute. Although this scheme was successful in several air-drop tests, however, photographs showed that as the pack just passed the rear of the re-entry capsule, before the lines were taut, the jacket was opened. If the canopy is trapped in the wake, sometimes it will not open. This is a potential hazard. Lin Huabao [[2651 5478 1405], who was in charge of the Recovery Technology Laboratory at the Design Institute of Electrical Machinery, changed the way the parachute was opened to a semi-reverse pull method in an air-drop test in July 1972. In 1973, it was again changed to a full reverse pull scheme to ensure its reliability.

Various performance parameters associated with the parachute were obtained in these tests. It was found that there was considerable safety margins as compared to the design requirements. In 1974, Lin Huabao and his colleagues systematically sorted out the data acquired in the air-drop tests and obtained various aerodynamic parameters for the parachute system which served as the basis for the finalization of the design of the parachute system.

In the aspect of recovery control, the "overload—time" scheme was chosen as the primary control and simple time control as auxiliary control. This scheme is highly adaptable and reliable. The principle behind "overload—time" control is that when the overload due to the atmosphere in the re-entry process increases to a certain value a switch on the satellite is turned on to activate the time controller which sends out various recovery signals at different times.

Two technical problems had to be resolved to realize this plan. One is how to analyze orbit deviation and the other is what are the transition criteria (i.e. the criteria to send a command via remote control to switch to "overload—time" control from parallel control). In the former case, a random function method was used to conduct the analysis. In the latter case, the criteria were set by calculating the altitude of the satellite based on the measured re-entry orbit. Both technical problems were satisfactorily resolved.

When the recoverable capsule descends to approximately 16km, the bottom heat shield (including the body of the retrorocket) must be ejected to make way for the parachute to come out. Since it is moving at high speed, there is a very strong wake at its tail. If the designed separation speed is too small, the parachute cannot come out. If the designed separation speed is too large, the thrust required is also going to be very high which adds to the weight of the force bearing structure. Therefore, it is necessary to determine the minimum separation speed and the minimum thrust required to eject the heat shield.

In 1974, based on the experimental protocol provided by the Beijing Design Institute of Electrical Machinery, the Beijing Institute of Aerodynamics modified the equipment in the wind tunnel to conduct transonic and supersonic force experiments on the bottom heat shield in the wake area. That was the first experiment done in China to study the wake of a satellite. The results were very satisfactory. Based on the data, the Design Institute of Electrical Machinery studied the separation mechanics of the heat shield and derived a practical algorithm for engineering calculation. This algorithm was used to calculate the minimum separation speed to provide a basis for the design of the ejection device. In all past flights, heat shield separation has been completely successful.

In order to improve the reliability of all components in the recovery system, a great deal of work was done. For instance, in the thermal vacuum test of the time controller, evaporation and degradation of the lubricant was found. The clock was getting slower and slower. After cleaning and re-lubrication, it went back to normal. With the assistance from the Institute of Materials Technology, Institute of Environmental Engineering and Lanzhou Institute of Physics, various tests were done in thermal vacuum on 6 lubricants to select the most appropriate one.

After the lubricant issue was resolved, a wear and tear problem surfaced. After running 10 times or so , the amplitude of the time controller dropped significantly and the error increased. Under the microscope, it was found that the escape wheel was severely worn out. The engineering staff at the Institute of Clocks and Watches in the Fenglei Instrument Plant of the Ministry of Light Industry inserted leaded brass sleeves over the escape wheel for erosion protection.

3. Comprehensive Ground Test of the Satellite

In order to ensure the normal operation and safe return of the satellite, a series of comprehensive ground tests was done in the prototype development stage. Those closely related to the recoverable satellite included the thermal vacuum test of the whole satellite and the separation of the two capsules.

(1) Thermal Vacuum Test of the Whole Satellite

A special test device (KM3 thermal vacuum chamber) simulates the heating and vacuum conditions experienced by a satellite in orbit. It measures the temperature variation on the surface of the satellite and in the instruments in the satellite. The temperature measured at the end of orbiting is the initial temperature of re-entry. The KM3 thermal vacuum chamber was completed in 1970 by the Institute of Environmental Engineering and Lanzhou Institute of Physics. Huang Bencheng [7806 2609 6134], a designer at the Institute of Environmental Engineering, was responsible for this project. KM3 could attain a vacuum of 0.000000001 torr. It not only met the requirements for testing a recoverable satellite but also was a breakthrough in vacuum technology. It met the world standard in the 1970's.

In other countries a low temperature vacuum chamber twice the size of the satellite is normally used to conduct the thermal vacuum test. In addition, a solar simulator comprised of high power xenon lamps is used to heat up the satellite. Although China had begun the development of the large KM4 vacuum chamber, the progress could not meet the needs in the development of the recoverable satellite. The Spacecraft Design Department completed the test with the 3m diameter, 5m long KM3 medium thermal vacuum chamber. They used infrared lamps in place of solar lamps and modified the temperature measurement wiring to improve the performance of the equipment. From July to October 1971, two tests were done to obtain the necessary data for the development of the satellite's temperature control system.

(2) Capsule Separation Test

In order to ensure the normal recovery of the return capsule, it is necessary to perform a capsule separation test (instrument capsule and re-entry capsule) in simulated orbit on the ground under weightless condition. The separation was accomplished with four exploding bolts and two small separation rockets. The objectives of the test were to determine the reliability of the separation mechanism, measure the separation speed and the impact overload upon separation, and measure the attitude angle changes in the separation process. The Institute of Environmental Engineering explored various ways to improve the test techniques to allow the re-entry capsule and instrument capsule to move freely. Two separation tests were done to obtain the necessary data.

4. Coordinated Test between Ground and Sky

In the prototype development stage, tests on the radio system on the satellite and the ground was required. These tests could be divided into two major categories: satellite—ground flight calibration and connection test and recovery area air-drop test.

(1) Satellite—Ground Flight Calibration and Connection Test

This is to simulate the tracking, external measurement, remote sensing and remote control of the satellite in the initial re-entry stage when it is still in orbit. The objectives of the test were to check the performance and coordination of the instruments on the satellite and on the ground, test the coordination of the operating procedure between the satellite and the ground and to train the operator in order to accumulate experience for real missions.

The first test was done in the summer of 1972 in Shandong. After two months of testing, the scheme was found to be correct and feasible and the equipment was found to be reliable. The primary flight program for the recoverable satellite was experimentally verified.

(2) Ground Tacking System Test and Air-Drop Test in the Recovery Area

The Satellite Ground Measurement and Control Department of the NDSTC was responsible for the ground tracking and orientation system in the recovery area. The air-borne ultra-short wave directional compass was made by Factory 3327 of the Third Ministry of Machine Building. The flight test was done in 1970 to determine the installation position and major specifications on a "Zhi-5" helicopter. By the end of 1971, a tracking and orientation test was done in the air. A model equipped with a beacon was dropped from an H-5 aircraft from high altitude to be tracked by a "Zhi-5" equipped with a compass. Both tests showed that the directional compass met the design requirements. During this period, the Tianjin Bohai Electronics Instrument Plant developed a ground orientation vehicle after a year of struggle.

In order to allow the recovery team to receive some actual training to improve its capability to spot and recover the re-entry vehicle, to verify the coordination between the beacon on the satellite and the orientation equipment on the ground stations and on the helicopter, and to repeatedly test the reliability of the recovery system, two air-drop tests were conducted in the recovery area. The first air-drop test was performed in the satellite recovery site in Sichuan in May and June 1972 by the Satellite Ground Measurement and Control Department and Space Technology Institute under the leadership of the Chengdu Military Region. That was a drill to recover a satellite in an air-drop which simulated real conditions. It was a large-scale test which involved many organizations. All the participants enthusiastically cooperated in the effort and smoothly completed three tests in a one month period. The objectives were essentially accomplished. In September 1974, the second air-drop test was again conducted in the satellite recovery site in Sichuan.

5. Assembly and Testing of the Satellite

In early 1973, the final recoverable satellite was under development. The actual satellite had very tight technical requirements and involved a great deal of work. In the development process, product quality was rigorously controlled by the technicians and workers, from design, production, testing, assembly and final testing.

The quality of the satellite assembly must be evaluated. It includes the measurements of center of gravity, weight, static balance, dynamic balance and rotational inertia. Because the re-entry capsule is spin stabilized when the retrorocket is fired, the dynamic balance and weight distribution of the re-entry capsule must be checked to ensure that its attitude is not disturbed much to reduce landing dispersion. However, unlike other machines, the re-entry capsule does not have a fixed axis of rotation which makes it more difficult to measure its dynamic balance. The Satellite Assembly plant modified a horizontal dynamic balance machine and designed a special balance clamp to rotate the capsule along its geometric axis to successfully complete the test.

Based on the design requirement of the satellite assembly, the moments of inertia of the satellite and the re-entry capsule must be measured around all three axes. At that time, China did not have a torsion pendulum. The Satellite Assembly plant used a tri-axial torsion pendulum method to measure the moments of inertia of the satellite and the re-entry capsule around the longitudinal axis. It used a two-axis torsion pendulum method to measure the moments of inertia of the instrument capsule and the re-entry capsule around the two transverse axes to meet the accuracy requirements.

Section 2. The Launch and Recovery of the Satellite

1. First Launch Recovery an Essential Success

In August 1975, Zhang Aiping, commissioner of the NDSTC, listened to a briefing on the quality of the recoverable satellite and the "CZ-2" launch vehicle. He asked that quality should be of top priority to ensure success in the first launch.

On 15 November, the recoverable satellite and the "CZ-2" launch vehicle were completely tested in Jiuquan and then transported to the launch pad.

After all preparation work was finished, it was launched on schedule on 26 November 1975. The rocket carried the satellite into its pre-determined orbit according to

the flight plan. The orbit had a perigee of 173km and apogee of 483km. The angle of inclination was 63 degrees. It entered orbit with accuracy that met the design requirements.

After the satellite entered it orbit, ground stations scattered over China began tracking, orbit measurement, remote sensing and remote control.

When the satellite entered it 47th orbit, the remote control station issued a command to adjust its attitude. The ground reception station immediately received the remote sensing parameters measured when the satellite was adjusting its attitude. It was normal. The remote control station issued another command to disengage the re-entry capsule from the instrument capsule and to activate the timer. The separation rockets in the instrument capsule were ignited to separate the two capsules. The re-entry capsule began to spin and the retrorocket was fired. In the control center in southern Henan, people were looking at the recorder showing the orbit parameters of the satellite. It showed that the retrorocket was operating normally. At that time, everyone was very excited. They shook hands with each other to congratulate themselves. After 8 years of hard work this moment finally came true. The satellite would soon return to China.

After the satellite was put into the sky, the technical staff involved from the Seventh Machine Building Ministry and the Weinan Control Center worked non-stop in the 3 days that the satellite was orbiting. They monitored and collected information on the flight of the satellite at their posts. At the critical moment when the satellite was passing over a remote control station, both automatic and manual control mechanisms for the antenna broke down. In order to grasp the opportunity, the assistant team leader and three team members risked their lives to climb a 15 meter tower to implement the emergency plan. They stayed calm when faced with high power high frequency radiation to handle the antenna to track the satellite according to the forecast angle to get the job done.

In the launch and recovery process, the entire country offered a great deal of support. For example, the Ministry of Post and Telecommunications dispatched 103 channels for communications. Twenty-seven provinces, cities and autonomous regions participated in communications. Military militia were put on duty to make sure channels remained open.

The first recoverable satellite China ever launched operated normally in orbit for 3 days. On 29 November, the satellite returned to China according to schedule with remote sensing data. In the recovery process, there were some problems. For instance, the skirt was burned up as the satellite re-entered the atmosphere. Some cables and instruments were also damaged. The landing point also deviated substantially.

2. Smooth Recovery in the Next Attempt

Specifically in response to the burning of the skirt and the deviation of the landing point in 1975, the Institute of Space Technology conducted a serious failure analysis. The landing site was inspected and observers were interviewed to collect relevant objects and information. All recovered objects were carefully examined and tested. It was determined that the highest temperature occurred at the middle of the skirt. Metallographic analysis was done on the burned skirt and its fragments. The data collected in the magnetic recorder in the recovered capsule was processed and analyzed.

Because the failure was primarily caused by the design, the design had to be improved for the safe recovery of the satellite. Kong Xiangcai [1313 4382 2088], the person responsible for the re-entry satellite assembly in the Spacecraft Design Department, organized a task force in 1975 to solve the heat resistance issue by improving the design. It created favorable conditions for design improvement.

In May 1976, the Space Technology Institute decided on the improvement measures to be taken for the 1976 re-entry satellite. In order to solve the skirt problem, the staff at the Institute of Space Technology worked overtime to re-design and produce a qualified product to complete the assembly and testing of the satellite in time. During this period, the Spacecraft Design Department completed the skirt design in half a month. With the support of other organizations, a new skirt was made in 2 months. In October 1976, as the Gang of Four was crushed, another recoverable satellite and its launch vehicle were shipped to the Jiuquan launch site.

At 1222 on 7 December, 2 minutes away from rocket ignition time, the commander issued the order to "retract the tower arms." The operator pushed a button and the crank did not move. He pressed again and the crank remained still. Obviously, it malfunctioned. The commander decisively ordered to send people to start the crank. Three soldiers dashed out of the basement toward the tower several dozen meters away. Since it was very close to launch time, the power to the elevator was cut off. In normal circumstance no one would be allowed near the rocket. They ran up the ladder to the top of the 30-meter tower and successfully moved the crank by hand. Then, they ran back to the basement. It only took them 5 minutes to finish the job, but they had already missed the scheduled launch time by more than 10 minutes. There was an argument whether to launch or not. At that time, based on his experience, Zheng Songhui [6774 2646 6540], who was responsible for the testing of recoverable satellites in the Spacecraft Design Department, recommended to the commander to continue with the launch. The satellite was launched at the optimum time. This was an optimum launch time achieved by all the participants.

After the satellite entered orbit, the personnel at the Weinan Control Center worked for 3 days and nights. They encountered two problems. The amount of gas consumed in attitude control was too high. Therefore, it was a concern whether there was sufficient gas to adjust the attitude in re-entry 3 days later. In addition, measures taken to eliminate interference which causes attitude deviation failed. The commander decided to recover it in 3 days as planned after he gathered opinions from everyone. He also decided to adjust the time to disengage the two capsules according to the pressure in the capsule to allow the satellite to land in the recovery area.

On 10 December, as the satellite entered its 47th orbit, the remote control station issued an attitude adjustment command to begin re-entry. The attitude angle measured by the large angle sensor indicated that the re-entry attitude was normal. It was followed by the issuance of the capsule disengage command by the remote control station. The two capsules were smoothly decoupled. The timers in the re-entry capsule were activated. The two time controllers issued a series of commands to fire the spinning rocket, ignite the retrorocket, fire the spin brake rocket and turn on the beacon. The re-entry capsule flew toward the ground along the pre-determined path.

Based on the data obtained by radar after the retrorocket was shut off, the Weinan Control Center issued a command via remote control to switch to "overload—time" control according to the recovery control criteria. When the axial overload of the return capsule reached 6.5g, the contact of the overload switch closed to activate the timer. From this point on, the time controller issued a series of commands to eject the bottom cover and retrorocket shell, eject the drogue chute, separate the deceleration chute, and pull out the main chute. It functioned normally without incident and the main chute together with the capsule landed safely at 14 m/sec in the recovery site in Sichuan. The capsule and the instruments in the capsule all remained unharmed.

It was very busy in the recovery area in Sichuan. Five ultra-short wave directional vehicles were placed in position according to the projected landing spot the day before. Half an hour before the satellite returned, four helicopters equipped with directional compasses were sent to hover over a standby point. Ground search teams with medium wave directional devices were also positioned in place. In the command center, the atmosphere was solemn. On a large rectangular table, there was a map of the area marked with the return path and positions of various tracking stations. Reports from these tracking stations could be heard from the public address system.

At noon, thunder was heard over the sky in the predetermined landing area. Some people saw a black spot flying from the northwest. It split into two. One of them (the heat shield of the capsule) came down faster and landed on the other side of the highway. The other (the re-entry capsule) descended slowly with a parachute and finally landed in a vegetable garden on the slope.

The directional compasses in all four helicopters received the signal from the beacon on the satellite. They all flew toward the pointed direction. The helicopter at the northwest corner of the area which was also closest to the satellite spotted the satellite visually. Within 3 minutes after the satellite landed, the helicopter also landed on top of the hill approximately 100 meters away. The people on the helicopter and the local people arrived at the scene to secure the area.

Soon afterward, workers arrived at the scene by helicopters and automobiles. They inspected and tested the returned capsule and recovered the film magazine and magnetic recorder. The entire re-entry capsule remained intact. Not a single screw was missing.

3. Off to a Good Start for 1978

After the successful launch and recovery of a satellite in 1976, China again successfully launched a recoverable satellite on January 26, 1978. After learning of the success, Ye Jianjing, vice chairman of the Central Military Commission, said that China was off to a good start for research and development in 1978 and wished his comrades more victories.

After orbiting for 3 days, the satellite completed its remote sensing mission and obtained a lot of information. On 29 January, it successfully returned to earth according to schedule.

In the Chinese National Science meeting held in the spring of 1978, Deputy Director of the Institute of Space Technology Sun Jiadong [1327 1367 2767] described the development process of the recoverable satellite in detail. Many technical accomplishments were acknowledged at the meeting.

Section 3. Practical Recoverable Satellites

1. Practical Recoverable Satellite Plans

From 1977 to 1980, the Institute of Space Technology repeatedly studied various plans for applied recoverable satellites. It was decided to take full advantage of the success to modify the design based on the first few satellites. The major differences or improvements of the applied satellite, as compared to the experimental satellites (i.e. the three recoverable satellites already launched) were to change the orbiting time from 3 to 5 days to obtain more remote sensing data, to adjust the re-entry attitude angle to improve landing accuracy, to reduce the structural weight of the satellite and change the weight distribution of the re-entry capsule, to add an electronic camera (CCD) to test electronic photography, to increase real time telemetry after the two capsules are disengaged to monitor the implementation of re-entry

steps, and to measure re-entry angle of attach, skirt heat flow, heat sink temperature and external pressure to analyze the dynamic condition, heat flow, and load on the re-entry capsule in the atmosphere. During recovery, the time controller is electrically wound and the ground station receives an engagement signal for ease of use. The satellite is equipped with a weather radar transponder for search and recovery. It will improve the accuracy in predicting the landing spot.

2. Testing of Practical Recoverable Satellites

The guiding philosophy in the development of applied recoverable satellites is improved reliability. To this end, a series of quality control measures was taken. It was clearly specified that all modified parts must be proved and ground tested with the approval of the chief designer. All electronic equipment must be burned in to discover components that are pronged to premature failure. After the satellite is assembled and tested, it will have to pass a vibration test before it is allowed to be shipped. Double quality checks were continued to be required.

In the spring of 1981, remote control, telemetry, tracking and program control was tested in seven stations in both static and dynamic mode to ensure the reliability in coordination and interface.

The addition of a weather radar transponder for search and recovery was requested by the Satellite Control Department. The objective was to improve the accuracy of forecasting the landing spot. In three flights beginning in 1982, it was found to be effective. The accuracy in location was significantly raised.

In order to evaluate the improved recovery system, especially to test the coordination between the on-board transponder and the ground weather radar, five air-drop tests were done in the winter of 1981. A full size model was dropped from 10,000 meters. They were all successfully recovered.

On 9 September 1982, 19 August 1983 and 12 September 1984, China successfully launched three applied recoverable satellites. They were all successfully recovered. As compared to the experimental satellites, more high quality remote sensing data were obtained. The electronic camera also worked well, producing very clear pictures. It provides conditions for China to develop real time remote sensing satellites.

When the applied re-entry satellite was successfully launched in 1982, the Chinese Communist Party was holding its 12th Party Congress. The presiding group sent a telegram to congratulate the development group. The telegram read: "We learned about the successful launch of the satellite as the Chinese Communist Party held its 12th Congress. This is another victory signifying the independence of the Party. We wish to congratulate all the people involved in the development, testing, tracking, control and technical assurance. We hope you will continue to make contributions toward the Four Modernizations in China."

In October 1985, China successfully launched and recovered a satellite to survey its territory. It gathered a great deal of data on our natural resources which provides the important scientific basis to formulate economic polices.

From 1975 to 1985, China successfully launched seven recoverable satellites and gathered a lot of remote sensing data. They all returned safely to China according to schedule. Recoverable satellites were used to take a large number of photographs over China which have been widely used in research and production, including oil and mineral prospecting, seismology survey, ocean and coastal survey, harbor and river construction, mapping and archaeological exploration. (See Chapter 6, Section 2 for details.)

A recoverable satellite is a complicated spacecraft. It is not easy to achieve reliability. The satellite contains thousands of elements and components. One problem may result in the failure of the entire experiment. In other countries, success was obtained after several failures. China was essentially successful in its first attempt. Since then, satellites were successfully recovered five times in a row. This indicates that this accomplishment is achieved with a small price in flight testing.

Of course, remote sensing satellite technology in China is still way behind compared to the technical standards in other nations in the world. The success in re-entry only shows that China has a grasp of satellite and projectile re-entry technology. We have to strive for more advanced spacecraft re-entry techniques. Achievements in remote sensing technology only show that China has a grasp of basic satellite remote sensing technology, but still needs to master the technology for higher resolution and other methods of remote sensing.

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NORTHEAST REGION

Forum on Educational Fund Shortages

40050200a Shenyang LIAONING RIBAO in Chinese 28 Jan 88 p 2

[Excerpts] On 24 and 25 January, Li Changchun [2621 7022 2504], Zhu Jiazhen [2612 1367 3914], Lin Sheng [2651 5116], and other provincial government leaders held an informal discussion in the hall on the second floor of Liaoning People's Theatre with some National People's Congress [NPC] deputies from the educational front. Vice Chairman Zhang Zhiyuan [1728 4249 6678] of the standing committee of the Liaoning Provincial People's Congress also attended the meeting. The people's deputies came away from the meeting with a clearer idea of the provincial government's financial difficulties. The provincial government, for its part, got a better appreciation of the importance of making educational development a top priority in national economic development.

Chen Yuhua [7115 3769 5478], a deputy from Jianchang County and principal of Jianchang Senior High School, said, "To go by the 'government work report,' educational investments in the province have risen continuously. Yet localities are finding it harder and harder to come up with educational money. Zhaoyang Shi's educational outlays amount to 90,408,000 yuan in 1988. Out of fiscal considerations, the city has tightened its belt as much as possible but still needs 86,713,000 yuan at a minimum. Under the existing financial contracting system, however, it will receive only 63,868,000 yuan in educational funding from the provincial government, leaving a shortfall of 22,845,000 yuan. In late 1987, the city was still short of 1.3 million yuan in teachers' wages. Not a single cent was allocated to elementary and secondary schools in the three counties of Jianchang, Kazuo, and Zhaoyang. Rural junior high and elementary schools in Jianchang were forced to close for the winter break 1 month earlier because there was no money to buy coal. Deputy Chen Yuhua proposed that we ensure the dual increases in education in accordance with central government regulations. Dual increase means that "educational appropriations by the central government and local authorities should increase more rapidly than the growth of their recurrent revenues and educational spending per student also should go up gradually." Judging by the present situation in the province, this demand by the CPC Central Committee has not been met. It is not known what the province's leadership intends to do about it. Guo Heng [6753 1854], a deputy from the Kalaqin Zuoyi Menggu Autonomous County, said, "The priority now is to raise the understanding of education among leaders at all levels. Take, for instance, the way our counties go about paying the teachers in locally-run schools. Special hardship villages may be poor but have done very well. Not rich villages, despite their wealth; they have the money but choose not to spend it on education. The issue here is one of understanding. Nowadays tall buildings are springing up one after another and the place is crawling with imported cars. Only education goes begging."

Director Gao Chenghe [7559 2110 0735] of the Liaoning Finance Department briefed deputies on educational investments in recent years. He said, "Between 1982 and 1986, we achieved the dual increases in educational funding. In 1987, the province had financial difficulties because it had to lend money to the central government. Consequently, the dual increases did not materialize. Judging by the province's financial situation in 1988, we are entirely capable of bringing about the dual increases. Please set your minds at ease." Next, Vice Governor Lin Sheng spoke and made a few suggestions. He noted that the provincial government took education quite seriously in recent years but that the deficit in educational spending remained substantial despite a tremendous effort on the government's part. In the future, all localities should translate educational investment from a theory into a top priority with action. Meanwhile, the provincial government should take additional measures to relax policies concerning work-study programs and income-generating education. Lin Sheng also pointed out that given the way things were, there would be no additional funding no matter how hard they looked. Thus total reliance on the government would not work; also needed was a vigorous effort to reform the educational system. We must adhere to the approach of operating schools at three levels and rely on the masses to run education. The practice of peasants coming together to raise funds for education should not be considered an extra burden or an exorbitant tax.

Vice Governor Zhu Jiazhen spoke on issues of interest to the deputies. He said, "This discussion has really educated me. I came to understand many circumstances and acquire a deeper insight into issues and problems on the educational front. Science and technology and education are the vanguard. How do we achieve them? I agree with what the deputies have said. First, education is not a question of poverty and wealth, but one of understanding and of priority. Our next step is to make governments at all levels pay attention to education and treat it as their top priority conscientiously. Second, education must be supported by all segments, all quarters; everybody must be mobilized to run schools. We also must come to grips with educational reform. The present 'spoon-feeding' system of depending completely on appropriations from the top does not work. Instead we should examine our educational work in accordance with the theory of the initial stage of socialism." He asked the deputies to overlook the fact that the budget report this year was not clear on the state of education. "I am here today to give a supplementary report."

Finally, Governor Li Changchun made a few points. He began by sincerely accepting the criticisms made by the deputies and said that they would be studied in earnest in order to find a solution. He said, "The most glaring

problem on the educational front today is funding. Finance lies at the heart of the predicament in which government now finds itself. Last year the province ran up a budget deficit of 200 million yuan (mainly caused by the central government borrowing from the localities). Financial problems notwithstanding, the provincial government must reinforce the strategic notion that science and technology and education must be given top priority and that everything must be done to reflect this in the budget. Owing to special circumstances last year, we did not achieve the dual increases. In the future, we must make sure that we do. Needless to say, even then we would still be a long way from solving the education problem." Li Changchun also said that current educational funds must be used wisely. "On the one hand, we are acutely short of educational funds. On the other hand, waste remains widespread. As far as capital construction is concerned, overlapping is a problem and people pursue large and comprehensive projects. Also, the provincial government is duty-bound to urge all cities to allocate educational funds based on the provincial budget and tighten supervision by auditing. They should also be asked not to go in for grand, ostentatious projects or to import large numbers of cars."

12581

Work Report of Liaoning People's Higher Court

40050200b Shenyang LIAONING RIBAO in Chinese 31 Jan 88 p 2

[Excerpts] On 24 January, Zhang Huanwen [1728 3562 2429], director of the Liaoning People's Higher Court, presented a detailed report on the court's work and achievements during the past year.

1. Criminal elements who seriously endangered social law and order and damaged the economy were severely punished. In 1987, the court handled the preliminary trials of 16,186 criminal cases, down 5.2 percent from 1986. In light of the new conditions and new problems in law and order, people's courts at all levels in the province worked closely with public security and procuratorial organs and mounted a special struggle throughout the province in a planned and systematic way. For instance, to keep up the momentum of the crackdown on crime, all localities in Liaoning convened large, open meetings last year where stiff sentences were handed down on a group of criminals who had murdered, robbed, raped, and committed major larceny or fled from the law.

In 1987, people's courts at all levels tried 3,381 cases involving economic crime and convicted 4,142 economic criminals. Apart from meting out punishment to the criminals, the courts made a serious effort to recover their ill-gotten gains. Altogether 37.91 million yuan in economic losses were made good for the state.

2. The administration of justice in the civil, economic, and administrative spheres was intensified.

Statistically, 60,676 miscellaneous civil cases and 11,687 assorted economic cases were tried in the province, up 17.7 and 21.8 percent, respectively, over 1986. According to incomplete data, the state promulgated over 500 administrative laws and regulations from 1979 to 1987. In Liaoning, 89 courts have established administrative tribunals or preparatory groups to deal with a host of administrative cases relating to law and order, food sanitation, environmental protection, land, and forestry in accordance with the law.

3. Settled cases left over from history in a practical manner.

Statistically, of the 10,961 cases the province's courts decided to reopen after review, 98.9 percent, or 10,839 cases, have now been closed. The original sentence was amended in 3,723 of the 10,839 cases. Since the retrials were largely completed before the 13th National Party Congress in October last year, they had a positive political and social effect.

4. Oriented themselves to the grassroots and intensified the development of people's courts.

The province stepped up the development of people's courts last year. To begin with, county people's courts and those in the outlying areas firmly streamlined the higher levels while reinforcing the basic level by selecting and sending a number of young and energetic court directors, judges, and university graduates to work in people's courts. Second, the distribution of courts was adjusted properly. An extra 73 people's courts were created in rural counties and in the outlying areas of cities. Over 50 courts with overly extensive jurisdictions and improper distribution were restructured. In the countryside today, there is on average a people's court for every 2 or 3 townships or about 50,000 residents, which makes it easier for people to file suit. Furthermore, the internal construction of people's courts was intensified. Special bodies have been set up inside provincial courts and intermediate people's courts in the cities to handle the courts' work. In people's courts at the basic level, the director in charge of court work devotes at least two-thirds of his time to in-depth court inspection and guidance. Over the past year, the people's courts also helped judicial administrative departments reorganize 3,514 mediation organizations and train 42,516 mediation cadres. People's courts handled more than 35,000 assorted cases, guided mediation organizations in settling 335,533 civil disputes, and prevented the occurrence of 2,000 potential murders and injuries.

5. Worked hard to standardize the work of people's courts. The standard of the administration of justice was improved across the board. Apart from 1,756 cadres already equipped with a college education, the courts now have 2,095 cadres attending part-time university who will graduate at the end of this year. By then 56 percent of the cadres in the courts will have legal expertise above the college level.

Zhang Huanwen said, "During the past year, the work of the courts in our province has had considerable achievements, which, however, still fall far short of the demands of the developing situation. Essentially, leading cadres of the courts have not studied in depth the many new conditions and problems that have appeared in the course of reform. Because the contingent of judicial cadres is small in size and poor in quality and the number of cases before the courts has risen sharply, it takes a long time for a small number of civil and economic cases to be heard. The difficulty the masses experience in going to court remains an outstanding problem. In some criminal cases, wrong verdicts are handed down and the penalties meted out are not proportional to the severity of the crime concerned. Sometimes, after a civil or economic case is decided, the sentence is not carried out promptly enough. As a result, the citizen's and legal person's legitimate rights are not effectively protected."

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